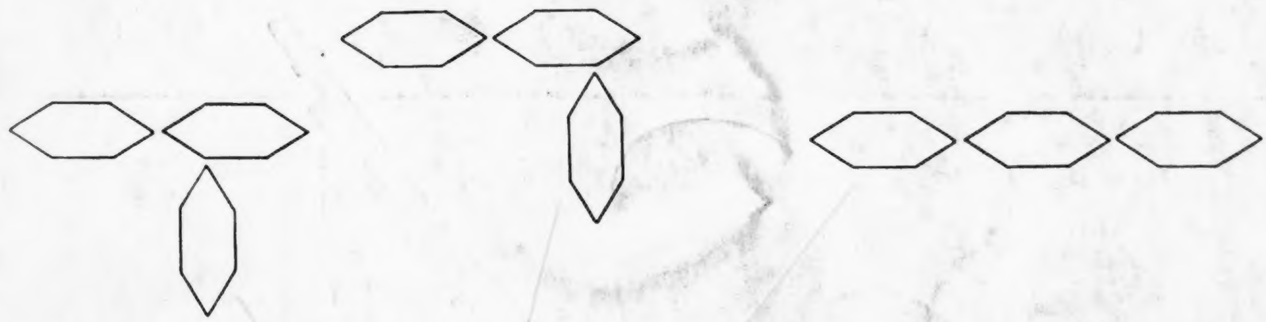
Vol. 51 In 2 Parts—DECEMBER, 1942—Part One No. 7 6

CHEMICAL INDUSTRIES

The Chemical Business Magazine



PROPERTIES OF TERPHENYLS				
	Mixed Isomeric Terphenyls	ORTHO	META	PARA
Color (NPA)	4–5	< 3.0	2.2–4.2	0–1.25
Density (g./cc.)	1.133	1.14	1.164	1.236
Melting Point Begins to soften Completely liquid	 60° C 140° C	 35° C 50° C	 75° C 85° C	 200° C 215° C
Solidification First crystals Hold point	 60–65° C 140–145° C	 —— < 50° C	 < 90° C 83–85° C	 209–213° C ——
Distillation Range D-20 (Corr.)	364–418° C	320–355° C	370–378° C	381–388° C
Flash point	191° C	171° C	207° C	207° C
Flame point	238° C	193° C	229° C	238° C
Viscosity at 210° F (Saybolt Univ. Sec.)	——	40	39.3	——
Electrical properties Dielectric constant Resistivity (ohm/cm3) 100° C 155° C 250° C	 2.58 140,000x10⁹ 550x10⁹ ——	 2.54 8,200x10⁹ —— ——	 2.62 2,600x10⁹ —— ——	 —— —— —— 30x10⁹

THE TERPHENYLS

can these new, high molecular weight, aromatic hydrocarbons help YOU?

The Terphenyls have only recently been made available commercially. They are offered as a mixture and as relatively pure individual isomers . . . at prices which may make it well worth your while to investigate their possible usefulness in your products or processes.

As high molecular weight aromatic hydrocarbons they open up new opportunities for chemical synthesis in the fields of dyes, drugs and organic chemicals. They may be halogenated, sulfonated or nitrated, and the sulfonates may be hydroxylated in the manner usual for aromatic radicals. Aliphatic radicals may be added by Friedel-Crafts reaction.

For experimental samples and further technical data, write MONSANTO CHEMICAL COMPANY, Phosphate Division, St. Louis, Mo.

MONSANTO CHEMICALS

SERVING INDUSTRY... WHICH SERVES MANKIND


GLASS
METALS
CHEMICALS
MUNITIONS
DYES
Potash Helps Win Battles
SOAP
DRUGS
ASPHALTS
TEXTILES
RUBBER
FOODSTUFFS
INSTRUMENTS
INDUSTRIAL GASES
Potash is vital . . . for machines, equipment and munitions. American production of Caustic Potash and Carbonate of Potash contributes heavily toward winning the war. Solvay Potash *is serving at the front!*
SOLVAY SALES CORPORATION

The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Contents

Volume 51 Number 7

DECEMBER, 1942

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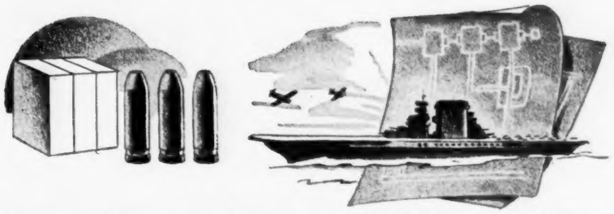
Substitute *for* Scarcity

1939!

Nineteen thirty-nine! That was the year Hitler started on his romp through Europe. And that was the year Mathieson introduced *synthetic salt cake* to the kraft paper industry. October, to be exact. At that time shipments of ordinary salt cake from Europe, which had supplied about half the salt cake required for our kraft pulping operations, were cut off by the war. Except for the timely intervention of Mathieson Synthetic Salt Cake, which has since proved itself superior to ordinary salt cake, there might have been a serious dislocation in the kraft paper industry.

How serious the threatened dislocation might have been, no one knows. But the gravity of the situation has been high-lighted by subsequent reports on the importance of paper and pulp products in the war effort. "So vital is paper in waging war," an authoritative source states, "it is estimated that the present struggle would be forced to stop within 60 days if the supply of pulp and its many products were cut off."



Among those products are 60,000 tons of kraft paper, required to interleave armor plate and cold rolled steel . . . 30,000 tons of kraft to package shells and high explosives . . . and an entire carload of blueprint paper to design one modern aircraft carrier! All this in addition to thousands of tons of paper required for other wartime purposes—notably to package the "tools" of war and to record its innumerable decisions and directives, at home and in the field.

An exclusive Mathieson product, *synthetic salt cake* is but one of the many aids to American industry developed by Mathieson chemists and engineers. Sodium Chlorite, another new Mathieson product, is widely used by the pulp and paper and textile industries as a bleaching and processing agent. And in Chlorine, Caustic Soda, Soda Ash and Ammonia, the Mathieson Alkali Works has made available not only to the paper industry but to *all* U. S. war industries four heavy-duty industrial chemicals that are vital to victory.

MATHIESON CHEMICALS

THE MATHIESON ALKALI WORKS (Inc.)
60 East 42nd Street, New York, N. Y.
LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS.

THE READER WRITES

The Kilgore Bill Analyzed

I would like to call to your attention the Kilgore Bill. The following letter was sent to Senator Kilgore in response to his request for an expression of opinion and I hope that you will see fit to publish this so that your readers may become acquainted with the dangers inherent in this proposal.

"The passage of Senate Bill 2721 to establish the Office of Technological Mobilization in my opinion would be exceedingly detrimental if not disastrous to the war effort. I speak as a research director with more than twenty-five years' experience in the petroleum industry.

"My convictions are based on the following:

"(1) Every laboratory in the nation is at the service of the government. These laboratories are headed and staffed by specialists in their particular fields, whether in universities, colleges, research foundations, or as individuals and corporations. It is unnecessary for the government to take these over.

"(2) Important and diverse research and developments vital to the war, assigned by the war, navy and other governmental departments, are proceeding at full speed in such laboratories in the hands of the men known to be best qualified to carry them on. These programs would be disrupted by any change in management.

"(3) Technologists, though primarily individualists, are submerging personalities in co-operative research of the widest scope, intent only with getting the job done as well and as speedily as possible.

"(4) To center these myriad researches in one institution would throw the programs out of gear, causing months or perhaps years of delay while adaptation to the new conditions took place, and during this time we could lose the war.

"(5) Leading companies in the oil industry, vigorous competitors in peacetime, are working together, disclosing to each other their processes, information and 'know how' relating to the manufacture of 100-octane aviation gasoline, the components of synthetic rubber, toluene for T.N.T. and other war materials produced from petroleum. There are no secrets in the oil industry for the duration.

"During the past week in Chicago, conferences were held, headed by the war department, Technical Advisory Committee to the Petroleum Industry War Council, where key research men of at least twenty oil companies, all that had any helpful knowledge of the subjects, presented and exchanged the knowledge and experience they had acquired since other recent meetings. Their researches, pilot plant tests and full scale commercial production of a number of key products for the war effort were freely discussed.

"Other industries likewise have pooled their knowledge in the same manner. Never in the history of the United States has there been such co-operation among competing companies in various key industries.

"It takes many years to develop a research organization to the highest efficiency. It is not a matter simply of training each man, but it is working as a team, each meshing his research into that of others so that the composite results will be productive for war or peace.

"If you take a man out of an organization where he has worked for a number of years, where his studies tie in with that of others, and put him into a new environment, you slow him up. It takes time for him to re-orient himself, even if he is in the same field; and if he is put into another field, priceless time is lost—he cannot learn the new field in a few months.

"To summarize—

"Individual research and development men and organizations are working single-mindedly to win the war, freely sharing information that is pertinent in any way to the war production program.

"They could do no more if they were directly employed by the government, and priceless time would be lost in the change-over.

"Industrial companies have forgotten the competitive race and are co-operating wholeheartedly, sharing their experience and their 'know how' in an all-out effort.

"Finally, should this bill pass, in my opinion it would be helpful to the Axis powers by slowing up our war effort."

GUSTAV EGLOFF
President
American Institute of Chemists
Chicago, Ill.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

War Production Clinic

The War Production Board wishes to continue to promote a better understanding of production problems in the manufacture of war material.

In order to do our part, we are planning a Production Conference Meeting to be sponsored by the Metropolitan Section of the Engineering Societies. The meeting will be on Thursday, January 7, 1943, at the Hotel Pennsylvania in New York City.

It is planned to start with a dinner, at which Mr. R. E. Gillmor, President of the Sperry Gyroscope Company, will be toastmaster, and Mr. William L. Batt, Vice-Chairman of the War Production Board will be the speaker.

After the dinner, there will be a number of simultaneous sessions where many phases of production will be discussed. A serious effort will be made to reach all small manufacturers who might benefit from such discussions.

G. J. NICASTRO
Chairman
Executive Committee
Metropolitan Section, ASME.
New York, N. Y.

Editorial Note: You are urged to attend these sessions. The first of such gatherings held at the Essex House in Newark on May 29 attracted nearly one thousand and the meeting was a pronounced success and unquestionably contributed in a very practical way to the war production effort.

Interest in Alkalies

Would it be possible to secure the February and March issue of CHEMICAL INDUSTRIES? I am interested in two articles in these two issues which deal with the history, processes and development of the alkali industry. These articles are entitled "The Saga of Salt" volume 50, No. 2 and "Twenty Years Work in Alkali Technology" volume 50, No. 3.

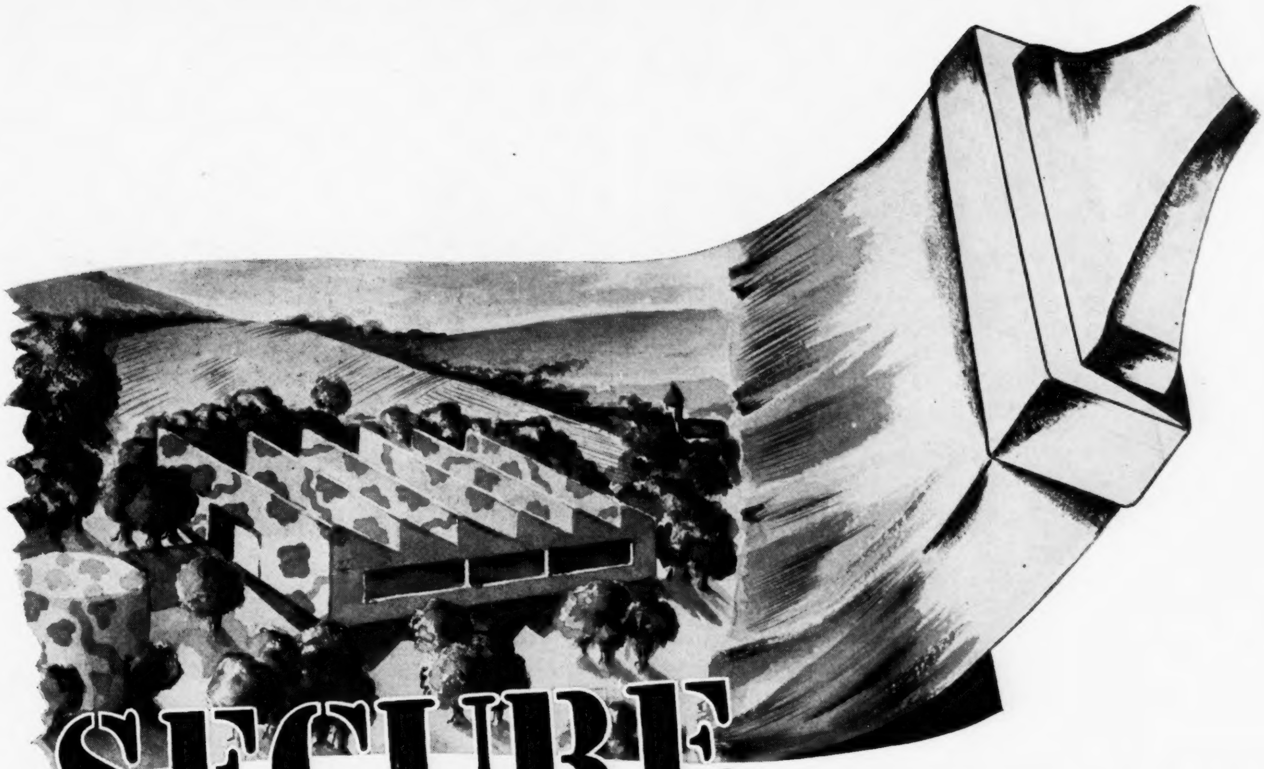
DEE A. ARMSTRONG
Ozark Chemical Company
Tulsa, Okla.

Library Fund

We are again making our annual appeal for funds for the Chemists' Club Library. During a crisis such as the world is now passing through, it might seem that we should discontinue appeals for funds for a scientific library. However, we all know that the winning of the war and our survival in the peace to come depends upon our scientific knowledge and progress, and that we cannot afford to suspend or materially curtail anything which contributes to that scientific progress.

NELSON LITTELL

New York, N. Y.



SECURE THROUGH CAMOUFLAGE

thanks to CHROMIUM chemicals . . .

The development of aerial photography using infrared sensitive film brought new requirements to the art of camouflage. In addition to deceiving the human eye it is now necessary to avoid detection by the infrared camera. This is accomplished by supplying the proper infrared reflectance to a camouflaged object so that it produces an image on the infrared film similar to the image produced by natural surroundings.

Chrome Oxide Green and Chromium Hydrate are outstanding pigments for camouflage purposes because of their high infrared reflectance. Because of this valuable property they are used in making up a wide range of colors which, when used in camouflage, cause objects to match and blend with surrounding scenery not only when viewed with eye but also when photographed on infrared film. Objects colored without regard to the proper infrared reflectance might appear perfectly natural to the eye and stand out in sharp contrast when photographed with the infrared camera.

Chrome Oxide Green is but one of the large number of chromium chemicals which have many applications in the war effort.

This use is but one of many applications of Chromium Chemicals to the war effort.

— • —

Bichromate of Potash **Bichromate of Soda**

Chromic Acid

Mutual Chemical Co. of America

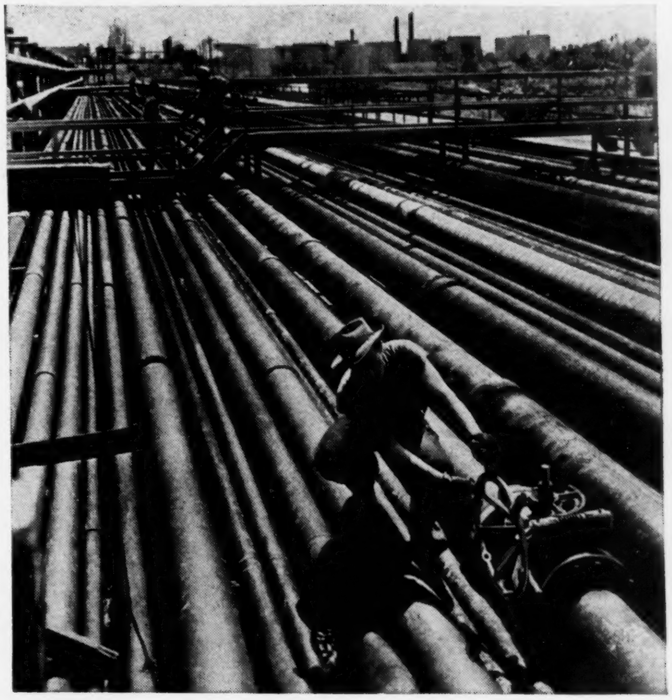
270 MADISON AVENUE, NEW YORK

Life On The Chemical Newsfront

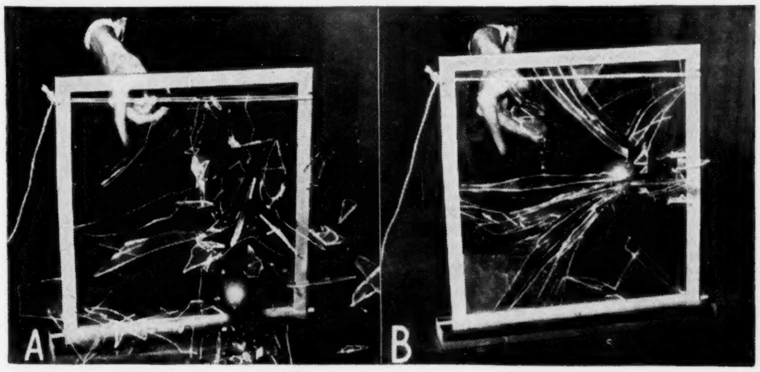
(*Above*) **AS THIS CHRISTMAS APPROACHES,** the traditional gaiety of the season is tempered by the problem of a nation at war. As the nation looks forward to the New Year, each American should resolve to do everything that lies in his power to make "Peace on Earth" an early reality.

(*Left*) **MAN-MADE WINTER** is produced in this test chamber to study the performance of airplane engines under conditions duplicating the sub-zero temperatures encountered in the frigid zones where American pilots and American-built planes are operating this winter. Extremes of heat and cold impose severe conditions on every part of an airplane engine—and particularly on the protective coatings, which, in addition to the temperature range, must withstand the terrific scrubbing action caused by the high-velocity wind produced by the propeller and the motion of the plane. Surface coatings that meet these requirements successfully are commonly formulated with synthetic resins derived from phthalic anhydride—of which Cyanamid is one of the country's major producers. Such coatings are characterized by their unusual combination of adhesion, toughness, and resistance to weather, light, abrasion, and oil, and by their exceptional durability under temperatures ranging from far below zero to blistering heat. As a result, finishes incorporating these resins are extensively used not only on airplane engines, but on a wide variety of other products which are subjected to extremes of heat and cold, or to other severe service conditions which impose exacting demands on the coatings used. In addition to the manufacture of synthetic resins, phthalic anhydride has many other important uses, including the production of pharmaceuticals, dyes, and pigments.

(*Right*) **IN THIS ARSENAL OF OURS—OIL IS AMMUNITION.** Carefully selected crude oils flow through this maze of pipes on their way to refineries for blending into 100-octane fuel for planes. In the oil fields, the tapping of new sources is being speeded up by the use of Cyanamid's drilling mud chemicals. When added to the drilling mud, these chemicals render inactive the compounds normally harmful to the mud, and maintain uniform mud quality. As a result, drilling time is substantially reduced.



(*Below*) **GAS DECONTAMINATION** is demonstrated by this soldier wearing a specially treated suit which protects him against dangerous vapors resulting from explosion of gas bombs. More than 4,500 pounds of a chemical decontamination agent can be supplied through the funds loaned Uncle Sam by your purchase of a $25 War Bond. *You* can help provide vitally needed materials for our armed forces by purchasing *more* War Bonds!



(*Above*) **SPECIFIC GRAVITY** of liquids or gases can now be determined by a new electric type of hydrometer developed by Ernest G. Ashcraft at the Crosby Research Foundation Laboratory. Providing a convenient means of measuring specific gravity, the device may be expected to find many applications in the chemical industry for laboratory work or for production control.

(*Left*) **SHATTERING OF GLASS** is almost completely eliminated by a new transparent elastic coating. Photo A shows effect of hurling a steel ball through a pane of ordinary window glass. B shows the effect of the same ball on glass coated with the new material. Though long cracks run through the glass, all except a few fragments are held fast to the elastic coating.

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Reg. U. S. Pat. Off.

WASHINGTON

By T. N. Sandifer

THE end of the year finds the picture at the Nation's Capital still kaleidoscopic, but when in focus, very much the same elements that have been apparent in the past twelve months are still present to the eye.

There is the same tendency to fight for power, among the various layers of agencies and directing executives, and this extends frequently to a surprisingly deep strata from the top. The Cabinet shifts are an administration effort, very belatedly, to correct this situation around the top layers, but the condition itself is virtually chronic. It seems to be something that people catch when they come to Washington. It offers a poor contrast to the actual war effort. By war effort, needless to say, is meant the effort out where bayonet meets bayonet and tank crashes into tank. There is a disposition at Washington to classify whatever one is doing as part of "the war effort" and the latter has been used as a shield for some absurd activities around the city which need not be detailed here.

T. N. Sandifer

The result of all this is that there are people conscientiously planning the war effort, or some part of it, working figuratively, alongside others who are primarily concerned with aggrandizement of their own powers, and some of the latter are in pretty high places, as the Washington term has it.

Such a condition puts a premium on strong agency heads, or in the case of WPB, division chiefs concerned with a given industry. While none of this applies particularly to the Chemical division, and the division is not in the forefront of any of these goings-on, nevertheless, the past year has furnished some severe trials of this unit, notably in connection with the rubber situation.

The year-end finds this division, under Dr. E. W. Reid, adjusting itself to the recent transition from status of "branch" to "division" with augmented responsibilities under the Controlled Materials Plan. The change has added names to the division, and mergers of functions of hitherto separate agencies, with the division, but beyond some changes of office location, the general impact of reorganizations from time to time has left little mark on its progress.

An activity now in progress of interest to the industry is connected with the CMP, and designed to assure adequate maintenance and repair materials to essential units of the chemical field. When the change from PRP to CMP was initiated, there were reasons for believing that PRP estimates of available materials for this purpose were perhaps over-optimistic. As a check on the figures at hand from PRP reports, there has been in progress a survey of materials at key plants in the industry, which is now about complete. It is expected that findings will be available to the industry in the near future as this is written.

Aside from this, one of the really critical developments now absorbing Chemical division's attention is in the pulp industry. The differences with Canadian pulp interests have not been adjusted at this writing, with the general situation that these industries are willing to ship the finished pulp products to the United States but are not willing to see pulpwood logs exported.

The reasons for this attitude are recognized in Washington, and conceded to be based on realistic self-interest—the mills in Canada would of course, gain by continued production and export of pulp to this country, and of course, would be contributing to similar maintenance of pulp mill activity in the United States if just pulp logs were shipped—nevertheless, the Washington attitude is assuming somewhat the same realism. The pulp industry in the United States is facing increasingly serious problems of raw material supply due to a number of factors, and accordingly Washington is ready to use some pressure in return on Canadian interests—in the effort to see that both sides benefit equally.

It is entirely likely that if Canadian pulp interests continue in their present position that Washington may begin to view certain priority grants and related matters in a similar light and the Canadian industries concerned would soon feel the effects. As a partial explanation of this reluctant decision at Washington to begin to use bargaining methods, a single sidelight on the conditions in the domestic industry will help.

Among certain elements in Washington there is a strong disposition to curtail pulpmill activity anyway on the ground that the labor could be profitably diverted to more direct war production. In fact, a start had been made toward actually shutting off a number of Southern mills, on this ground. The effect, of course, of such action would be felt by newspapers as well as many users of paper products.

Newspapers can be said to have very little hold on the affections of this particular group in Washington. They are more than ready, in fact, to take action that might have the effect of putting some publications out of existence, and in the case of others, seriously cut out revenue advertising. Such moves are in abeyance at the moment, but it can be seen that any appreciable decline in the domestic pulp paper supply would be a ready-made excuse for a number of such drastic orders affecting newspapers and consumers of other paper products.

As an aside, there is not likely to be any severe stringency of printing papers for technical publications and others rated generally as "essential"; on the other hand, some rather severe curtailment in the use of present grades of paper for containers and related products can be expected shortly. This move will probably order substitution of other paper, or hitherto unused grades in place of types now getting scarce.

In line with the comment here some time ago on other restrictions, it is recalled that the prohibition on delivery of chemical fertilizers for 1943 use has been extended through an amendment to M-231, to December 1.

Among the things to watch in coming months is the expansion of the smaller war plants utilization program, which now appears to be shaping up along definite lines. The procedure is not greatly changed from the initial plan of operations, but there appears to be much greater impetus to the program than in the past.

(Continued on page 908)

LAST
NEWS
TIME
FOR C.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON
PRICES
PRODUCTION
PERSONNEL

MARSHALL RESIGNS FROM GENERAL ANILINE

NEW YORK CITY, Dec. 18—Albert E. Marshall announced today his resignation as one of the five directors of General Aniline & Film Corp. to take effect Dec. 31. Under the office of Leo T. Crowley, Alien Property Custodian, he has been elected chairman of the board of directors of E. Leitz, Inc., makers of the Leica camera, now wholly engaged in war production. After Dec. 31, he will devote more time to chemical and research activity at Rumford Chemical Works, Rhode Island, of which he is president, and with the New England Industrial Research Foundation, of which he was an organizer in 1941. Appointed to General Aniline last March, Marshall served as executive vice-president of that company and as executive head of its Agfa Ansco division.

PERKIN MEDAL TO BE PRESENTED JAN. 8

NEW YORK CITY, Dec. 21—The thirty-seventh impression of the Perkin Medal, awarded annually by the American Section of the Society of Chemical Industry for outstanding work in applied chemistry, will be presented to Dr. Robert E. Wilson, President of Pan American Petroleum and Transport Company, at a meeting at the Hotel Commodore, Jan. 8. The medal will be awarded to Dr. Wilson in recognition of his research studies on such varied subjects as flow of fluids, oiliness, corrosion, motor fuel volatility, clay and glue plasticity, and humidity, and in recognition of his industrial contributions in the use of tetraethyl lead, petroleum hydrocarbon cracking, and adoption of chemical engineering principles by the oil industry. This is a joint meeting with the American Chemical Society, American Institute of Chemical Engineers, the Electrochemical Society and the Societe de Chemie Industrielle. Dr. Foster D. Snell will preside.

AMERICAN POTASH MOVES

NEW YORK CITY, Dec. 17—An announcement has been made of a change in location of the main executive and sales office of the American Potash & Chemical Corporation to 122 East 42 St., N. Y. City, effective Dec. 26th. Formerly at 70 Pine Street, New York City, the corporation is occupying space on the 25th floor of the Chanin Building.

GEORGE MANN DIES

PROVIDENCE, R. I., Dec. 16—George Mann, president and treasurer of George Mann & Co., Inc., textile chemical firm, and widely known among mill men, died today at Jane Brown Memorial Hospital. He was taken ill Sunday evening at his home in Rehoboth and admitted to the hospital as a surgical patient. He was an active club devotee, being a member of the Fall River Rod and Gun Club, Newport Rod and Gun Club, Chemists' Club of New York, and the Metacomet Golf Club. He belonged to the King Phillip

Lodge and Royal Arch Chapter, Order of Masons, in Fall River; the Eleppo Temple, Boston order of Shriners, and was a communicant of the Unitarian Church, Fall River. He leaves his wife, Edna (Leland) Mann; two sons, Billings L. Mann, his associate in business, and Lieut. Charles R. Mann, stationed at Camp Bowie, Texas; a daughter, Miss Edna Frances Mann, of Baltimore, Md.; a brother, Roswell B. Mann, of San Diego, California; a sister, Mrs. Bertha M. Smith, of Rehoboth, Mass., and a nephew, Pfc. Roswell H. Smith, stationed at Parris Island, South Carolina, with the U. S. Marine Corps.

PROJECT SERIES OF WAR ALCOHOL PLANTS

WASHINGTON, Dec. 21—The Chemicals Division of the War Production Board today announced the development of an engineering program for a series of war alcohol plants. Plans for the plants are to be completed and then laid on the shelf until needed. If built, the plants will be part of the 100,000,000-gallon increase in industrial alcohol capacity recommended by the Baruch rubber report.

FATS AND OILS SHORTAGE DUE IN 1943

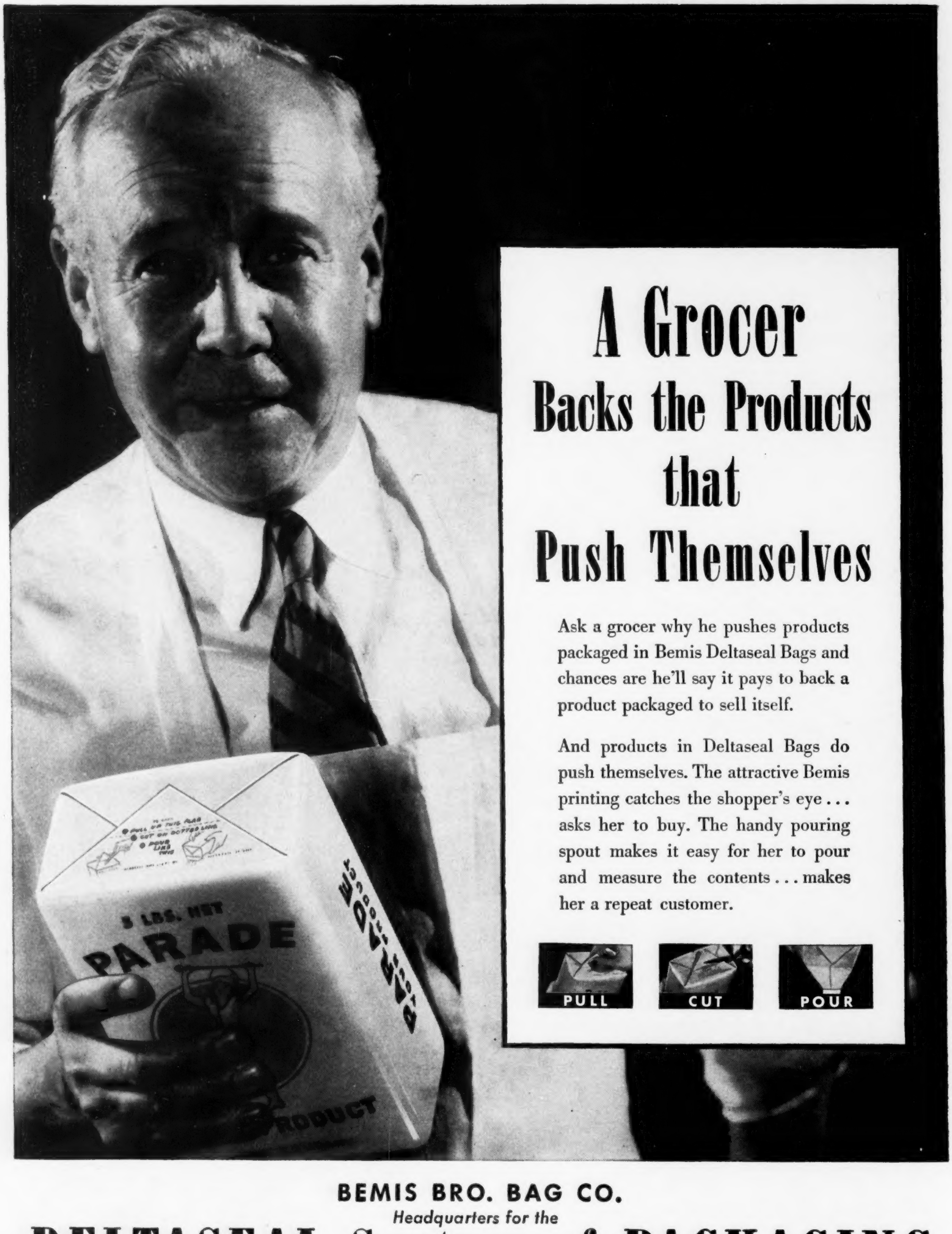
WASHINGTON, Dec. 21—An estimated shortage of between 800,000,000 and 1,000,000,000 pounds of fats and vegetable oils in the country's 1943 requirements for food and industrial purposes, is brought to the attention of the nation by a Department of Agriculture official. This shortage would be equivalent to 7 to 9 percent of present needs, even though some of these have been curtailed by the exclusion of edible oils from industrial use.

In spite of record-breaking crops of domestic oilseeds and grains this year, the extraordinary requirements of the Government for edible fats and oils for the armed forces and for Lend-Lease purposes, as well as the domestic needs for the civilian population, have put available production under severe strains. In addition, war-time industrial demands have been heavy.

The complete utilization of the large crops of peanuts, soybeans, linseed and other oilgrains has been impeded by the difficulties of transportation to the crushing plants, and there has also been lack of manpower to harvest the crop.

MIDGLEY PRESIDENT-ELECT OF ACS

NEW YORK, Dec. 23—Dr. Thomas Midgley Jr., vice-president of the Ethyl Corp., has been elected president of the American Chemical Society for 1944, it was announced here today. Dr. Midgley is internationally known for his discovery of tetraethyl lead as an anti-knock agent for gasoline. He has also contributed largely to the knowledge of the chemistry of rubber and the methods for synthesizing rubber. He is the holder of most of the high medals in chemistry and chemical industry.



A Grocer Backs the Products that Push Themselves

Ask a grocer why he pushes products packaged in Bemis Deltaseal Bags and chances are he'll say it pays to back a product packaged to sell itself.

And products in Deltaseal Bags do push themselves. The attractive Bemis printing catches the shopper's eye . . . asks her to buy. The handy pouring spout makes it easy for her to pour and measure the contents . . . makes her a repeat customer.

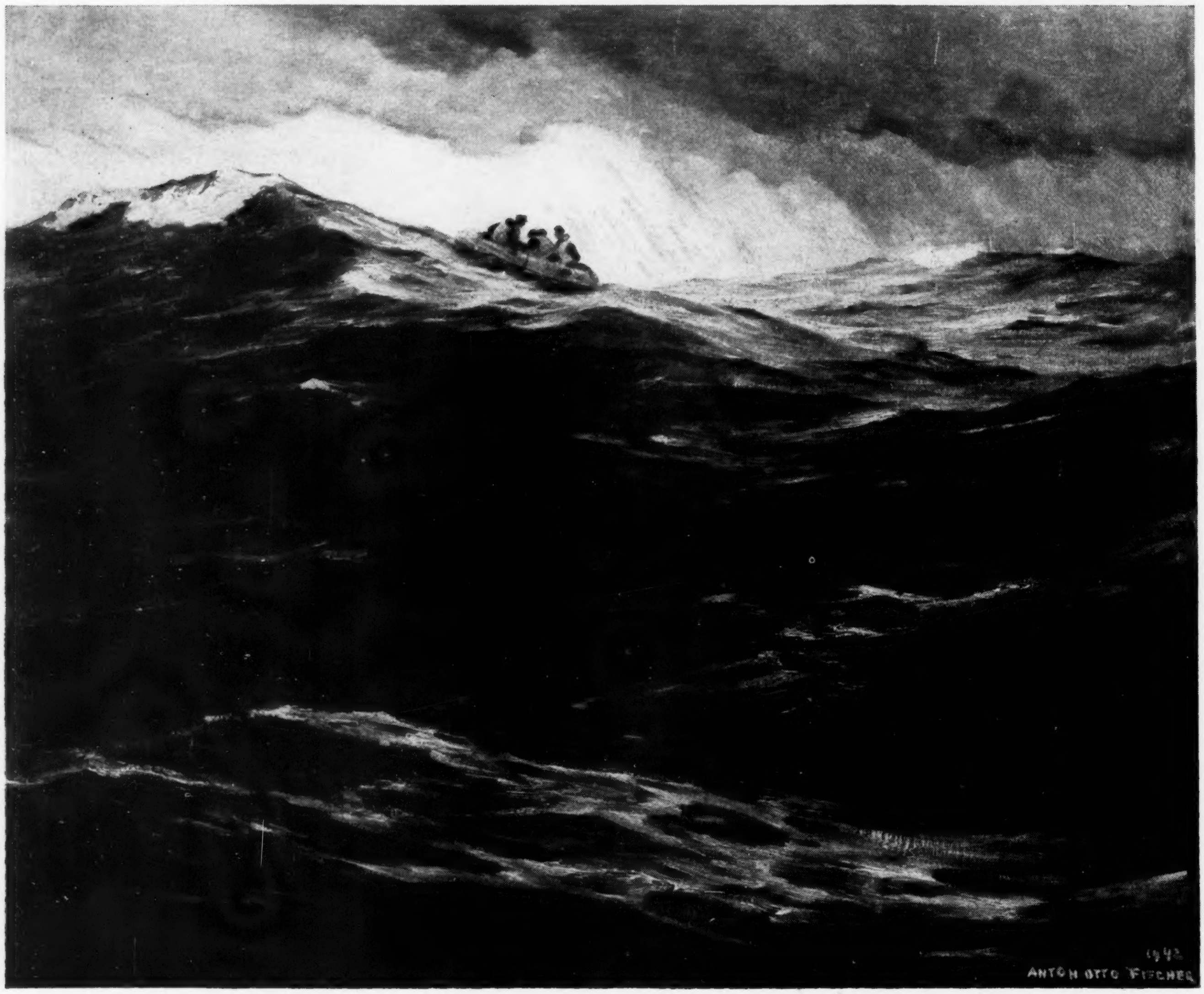
BEMIS BRO. BAG CO.

Headquarters for the

DELTASEAL System of PACKAGING

Minneapolis, Minnesota

OFFICES: Baltimore • Boston • Brooklyn • Buffalo
Charlotte • Chicago • Denver • Detroit • E. Pepperell
Houston • Indianapolis • Kansas City • Los Angeles
Louisville • Memphis • New Orleans • New York City
Norfolk • Oklahoma City • Omaha • Peoria • St. Louis
Salina • Salt Lake City • San Francisco • Seattle • Wichita



AIR — against WATER

Rising and falling with the waves . . . men on a rubber raft . . . human lives snatched from the sea . . . by a thin layer of inflated rubber.

Important? Yes. It's important that the thin sheets of rubber be kept free of cracks and blisters, that the raft unfold easily, that it be *safe* when it's needed.

That's why rubber life rafts are processed in special air conditioned rooms . . . to make the rubber tough and long-lasting. *Room temperature and humidity are maintained more exactly than ever.*

To do jobs like this, air conditioning equipment must be more precise, more flexible, more compact. Required "climates" must be reproduced faithfully . . . wherever and whenever wanted.

General Electric has already taken an outstanding part in developing this new kind of air conditioning for war industries. After the war, *all* users of air conditioning will benefit from the lessons we have learned in meeting these stringent war requirements.

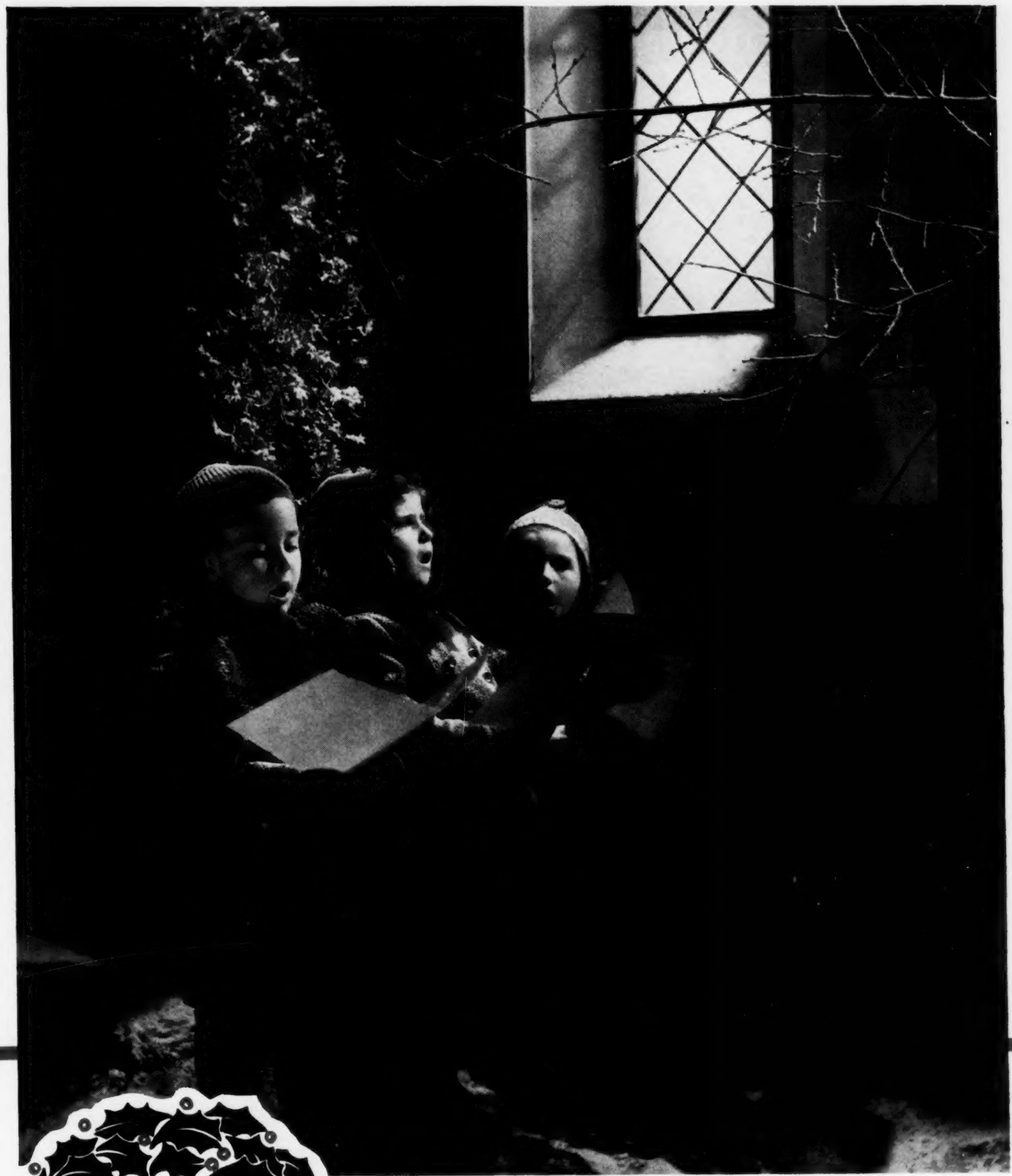
More people will enjoy air conditioning because it will be more compact . . . more economical. Cars will have it. Also planes and boats. Small stores, as well as large, will want it to increase sales, to keep goods fresh. Factories will demand it as an aid to production.

The place to turn for this new equipment will be General Electric . . . a logical source of heating, refrigeration, air conditioning, and heat transfer equipment of all kinds. Turn to G-E.

Air Conditioning and Commerical Refrigeration Department, Division 427, General Electric Co., Bloomfield, N. J.

Air Conditioning by

GENERAL ELECTRIC



The eyes of all America are upon the United States Treasury Roll of Honor appearing in the "Payroll Savings News." For copy write War Savings Staff, Treasury Department, Washington, D. C.

NEW 10% WAR BOND DRIVES SWELL TREASURY HONOR ROLL

HOW TO "TOP THAT 10% BY NEW YEAR'S"

Out of the 13 labor-management conferences sponsored by the National Committee for Payroll Savings and conducted by the Treasury Department throughout the Nation has come this formula for reaching the 10% of gross payroll War Bond objective:

1. ***Decide to get 10%.***
   It has been the Treasury experience wherever management and labor have gotten together and decided the job could be done, the job was done.
2. ***Get a committee of labor and management to work out details for solicitation.***
   a. They, in turn, will appoint captain-leaders or chairmen who will be responsible for actual solicitation of no more than 10 workers.
   b. A card should be prepared for each and every worker with his name on it.
   c. An estimate should be made of the possible amount each worker can set aside so that an "over-all" of 10% is achieved. Some may not be able to set aside 10%, others can save more.
3. ***Set aside a date to start the drive.***
4. ***There should be little or no time between the announcement of the drive and the drive itself.***
   The drive should last not over 1 week.
5. The opening of the drive may be through a talk, a rally, or just a plain announcement in each department.
6. Schedule competition between departments; show progress charts daily.
7. Set as a goal the Treasury flag with a "T."

As of today, more than 20,000 firms of all sizes have reached the "Honor Roll" goal of at least 10% of the gross payroll in War Bonds. This is a glorious testimony to the voluntary American way of facing emergencies.

But there is still more to be done. By January 1st, 1943, the Treasury hopes to raise participation from the present total of around 20,000,000 employees investing an average of 8% of earnings to over 30,000,000 investing an average of at least 10% of earnings in War Bonds.

You are urged to set your own sights accordingly and to do all in your power to start the new year on the Roll of Honor, to give War Bonds for bonuses, and to purchase up to the limit, both personally and as a company, of Series F and G Bonds. (Remember that the new limitation of purchases of F and G Bonds in any one calendar year has been increased from $50,000 to $100,000.)

TIME IS SHORT. Our country is counting on you to—

"TOP THAT 10% BY NEW YEAR'S"

EVERYBODY EVERY PAYDAY AT LEAST 10%

Save with War Savings Bonds

This space is a Contribution to America's All-Out War Effort by YOUR NAME HERE

CHEMICALS . . .
Available in Limited Quantities

. . . a bulletin about chemicals that can be supplied now in commercial amounts

CARBIDE and Carbon Chemicals Corporation produces more than 160 synthetic organic chemicals, and the supply situation among these products is constantly changing. Right now a number of them, including those described here, can be supplied in l.c.l. quantities. Some are available now because they are co-products in the making of other chemicals being used for high priority applications. Others are on hand because customers' plants have shifted to war production or cannot get other raw materials to go with them.

Before making a decision that depends on the supply of one of our products, check with us. Our technical service staff can give you up-to-the-minute information on delivery dates and quantities available. They can supply you with technical data on the chemicals we make, and can help you in the selection of replacements for unavailable materials.

At the time this magazine went to press these chemicals listed here . . . and a number of others . . . could be supplied in l.c.l. quantities. If you are interested in obtaining quantities of any of them, write or wire immediately since the supply situation may change at any time.

Diethyl "Cellosolve" is a stable ether that boils at 121.4°C. Since it dissolves both oils and water, it is a good mutual solvent, and it can be used with detergents and wetting agents of limited water solubility to prevent gelling or clouding in dilute solutions.

Ethylbutyl Acetate is a colorless liquid that boils at 162.4°C. Resembling amyl acetate in many of its properties and having the same toluene nitrocellulose dilution ratio (2.1), it is used as a moderately high boiling solvent in lacquers and synthetic resin finishes. Its evaporation rate is somewhat slower than that of amyl acetate; therefore, lacquers made with Ethylbutyl Acetate form smooth high-gloss films with little tendency to blush or orange peel. Ethylbutyl Acetate can also be used in nitrocellulose printing inks.

Isophorone is a high-boiling (215.2°C.) cyclic ketone with properties similar to those of cyclohexanone. It is the most powerful solvent known for polyvinyl chloride resins. Its carbonyl groups can be reacted with aldehydes, hydrocyanic acid, amines, and nitrogen derivatives, and it forms halogen, mercaptan, halogen acid, and alkyl amine addition products.

For information concerning the use of these chemicals address

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

A DEPENDABLE NAME FOR FINE CHEMICALS

APPEARING on the labels of more than 1,500 products used by customers in many fields—the name Merck is recognized as a dependable name for fine chemicals.

This high recognition is convincing proof of how well Merck & Co. Inc., manufacturer of fine chemicals for the professions and industry since 1818, has maintained the confidence of those whom it serves.

The Merck policies of scientific research, and rigid laboratory control of purity and uniformity . . . fortified by a rich tradition of experience and modern production facilities . . . ensure continued leadership in the present fields of chemistry, as well as in those still to be explored and conquered.

FOR VICTORY BUY WAR SAVINGS BONDS AND STAMPS

Our scientific staff and laboratories are prepared to serve you.

The illustrations below, made at the Merck plant in Rahway, N. J., are representative of the widespread activities of Merck & Co. Inc., in scientific research, modern production, and laboratory control of quality.

- **Pioneers in the Development of New Synthetic Chemicals.** Active in the manufacture of new synthetic chemicals ever since their therapeutic uses were demonstrated, Merck has played a prominent rôle in the development of this important line.
- **Original Large-Scale Producers of Many Fine Alkaloids.** The name Merck has been identified with the production of alkaloids and their salts for more than one hundred years.
- **Foremost in the Synthesis and Production of Pure Vitamins.** Discoveries and advances made in the vitamin field by Merck chemists and their collaborators, have continually emphasized the outstanding rôle played by Merck & Co. Inc. in the synthesis, development, and production of this therapeutically important line.
- **A Leader in the Production of Medicinal Chemicals.** Practically every chemical required by the physician or pharmaceutical manufacturer is available under the Merck label, and carries with it a guaranty of purity and reliability.
- **Manufacturers of Quinine Products since 1822.** Merck is headquarters for fine quinine products, the result of long experience and chemical skill.

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ASPERIN
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BUTYL ACETATE
BUTYL ALCOHOL
CARBON TETRACHLORIDE
CASTOR OIL
CELLUSOLVE
CELLUSOLVE ACETATE
CALCIUM HYPOCHLORITE
DICHLOR BENZOL
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TOLL OIL
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● Drums and pails are available in sizes from 3 to 55 gal. capacity. Convenient lever locking ring heads, bolted-on heads, or lug covered heads can be furnished according to requirements.

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TRADE MARK REG. U.S. PATENT OFFICE

LINED STEEL DRUMS AND PAILS

for absolute protection of chemical products during shipment and storage

EACH new chemical product we receive for packaging is tested in our laboratory, assimilating actual filling and storage conditions. Linings now in use are tested, or a new one is developed especially for the product, to provide a safe and positive protection when packed in *Steri Seald* lined steel containers.

WILSON & BENNETT MANUFACTURING CO., CHICAGO, ILL.

Subsidiary of Inland Steel Company

Plants at Chicago, Jersey City and New Orleans ● Sales offices in principal cities

Makers of Steel Drums and Pails

WILSON & BENNETT
Steri Seald
LINED STEEL CONTAINER
JERSEY CITY • NEW ORLEANS
CHICAGO
No.

THE GREEN GODDESS

Chlorine has been aptly termed the Green Goddess. Penn Salt is glad to have an important part in making her services available for our war effort.

But she is essentially a peace goddess, for in thirty-odd years of purifying public water supplies, chlorine has performed a humanitarian service in public health protection.

And, as a bleaching agent widely used in the paper industry; for organic synthesis, and many other chemical manufacturing processes, it has definitely earned Industry's appreciation.

Penn Salt takes particular pride in the fact that, in 1909, its Wyandotte, Michigan, works shipped the first tank car of liquid chlorine in the Western hemisphere. And now, as then, Penn Salt is exploring new possibilities for chemical service.

PENNSYLVANIA SALT MANUFACTURING COMPANY

1850 *Chemicals* 1942

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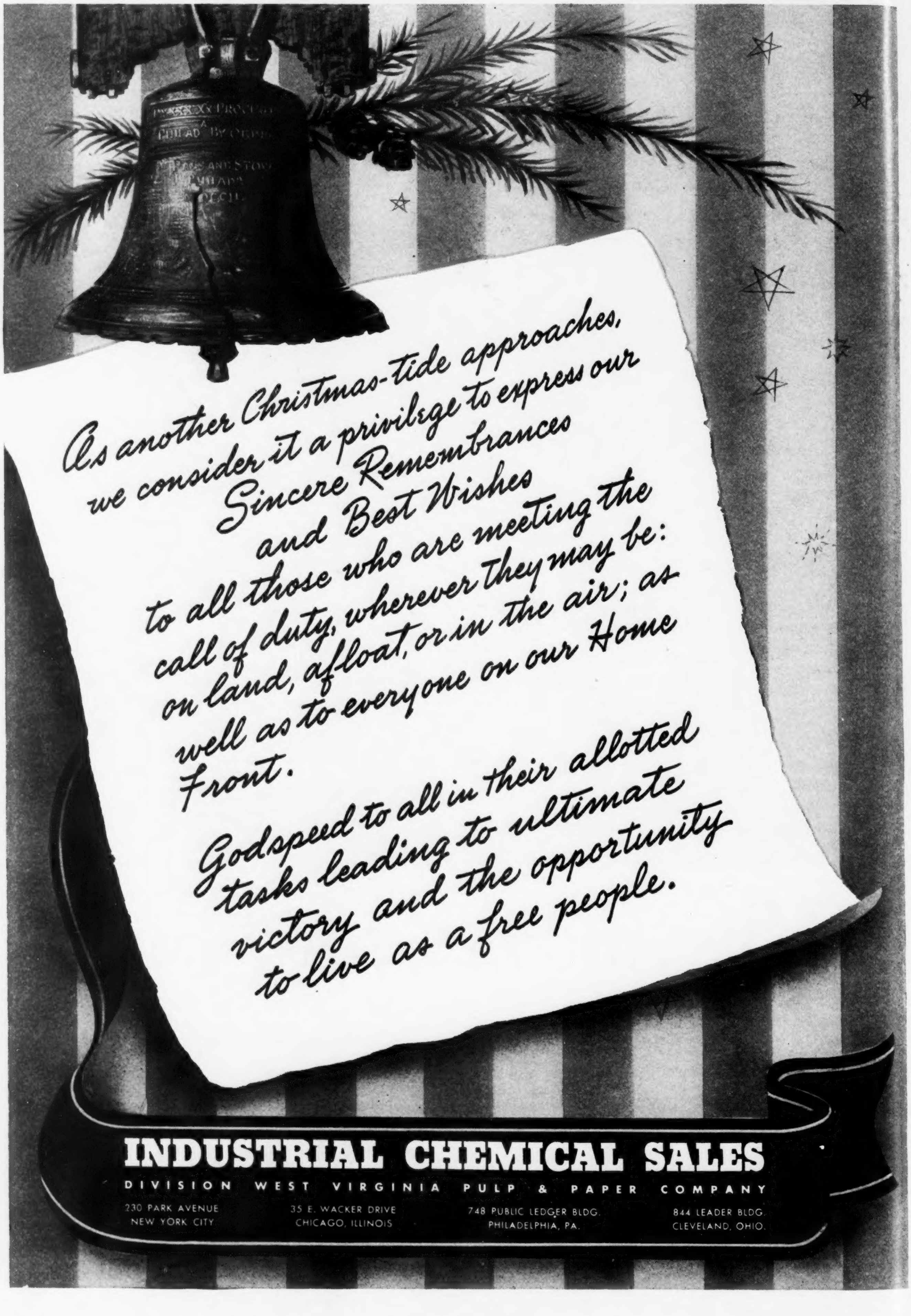
As another Christmas-tide approaches,
we consider it a privilege to express our
Sincere Remembrances
and Best Wishes
to all those who are meeting the
call of duty, wherever they may be:
on land, afloat, or in the air; as
well as to everyone on our Home
Front.
Godspeed to all in their allotted
tasks leading to ultimate
victory and the opportunity
to live as a free people.
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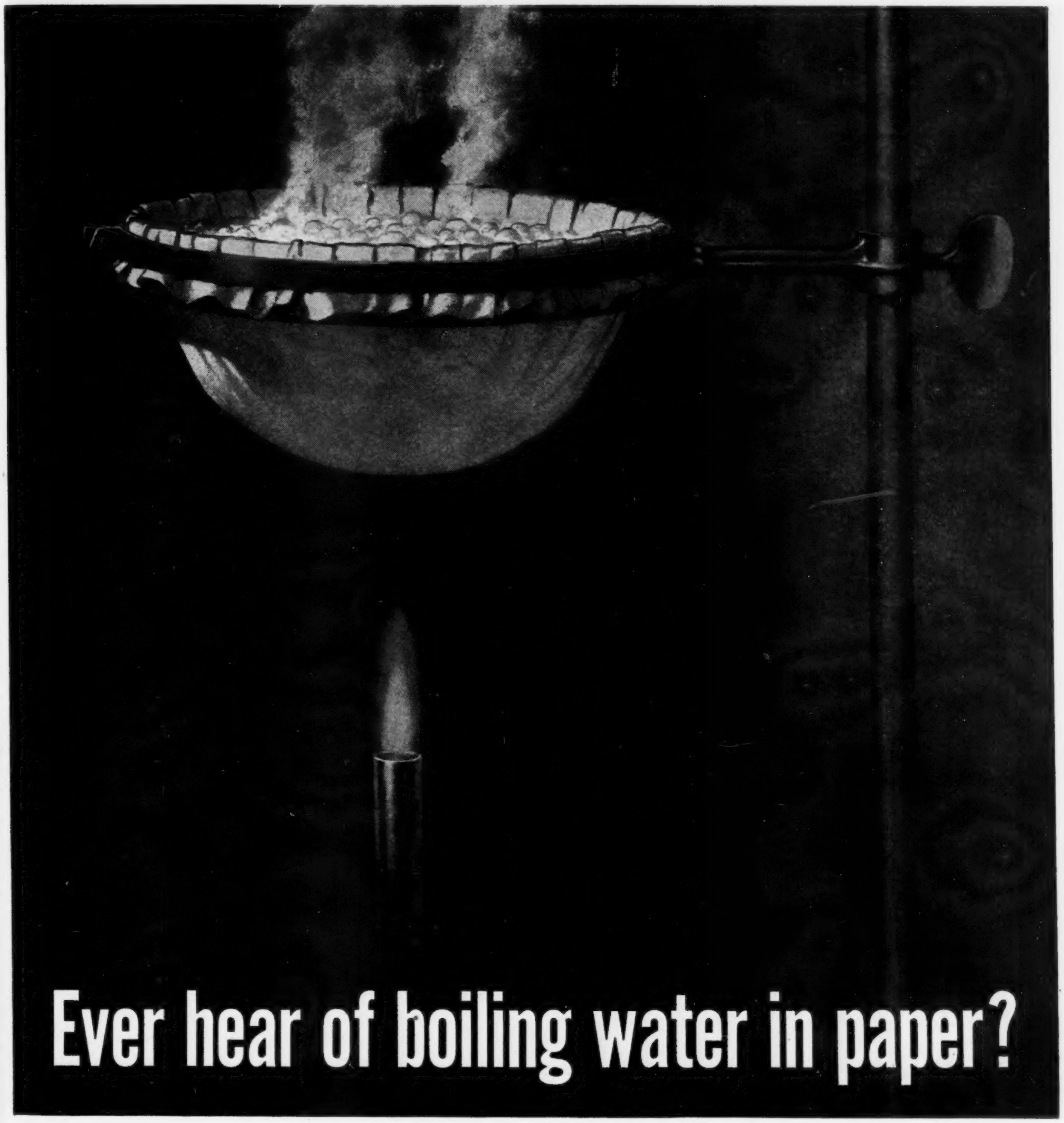


YES, in the research laboratories of Union Bag & Paper Corp. even that's been done! But manufacturers will have less interest in this experiment than in the fact that the South's abundant pulpwood supply is able to furnish kraft papers for thousands of uses...accomplish tasks once deemed impossible for paper to perform.

WITH MULTI-WALL CONSTRUCTION, Union Bag & Paper Corp. offers highly efficient methods of packaging and shipping agricultural, chemical, fertilizer, food and rock products...affords a decided weight and space-saving advantage.

IN THE FIELD OF WAR PACKAGING, Union Bag & Paper Corp. is able to make kraft papers resistant to oil, grease and water, super-strong, non-scuff, flavor-sealing, fold-enduring, and eye-appealing...is able to make kraft containers that have one, or ALL of these important advantages.

Whatever your wartime container or package problem... no matter how difficult it may seem...consult

UNION BAG & PAPER CORP.

WOOLWORTH BUILDING, NEW YORK, N. Y.

KRAFT PAPER—THE SERVICE UNIFORM OF AMERICAN PRODUCTS

That Man "Manpower" Is In Again

THIS country has now been at war a year and in that twelve months we have in certain directions at least exceeded our fondest hopes. We have not won all the battles, but we have very definitely assumed the initiative on several fronts. Eight months ago even our well-informed leaders, such as Donald Nelson and others, were very sanguine as to the possibilities of such action until well into 1943 and, indeed, were very fearful that we might lose the war in 1942. That we have been able to bring the war to Hitler and his satellites has been due largely to the courage and resourcefulness of the men of our armed forces backed up by a greatly accelerated rate of production of the implements of war, a pace by the way that few if any thought possible of achievement in such a short period of time.

We have fallen down badly, however, in certain directions, and the principal glaring ineptitude displayed by the Administration has been in the handling of the manpower problem. We were at war exactly 363 days before the President issued the directive that provided the very necessary powers to make intelligent use possible of our manpower. Indeed, up until December 5th the entire situation was in a badly muddled state with the Selective Service System, the WLB, the Department of Labor and the Manpower Commission extensively overlapping in their respective powers and activities.

Of immediate concern, of course, to the chemical industry is the problem of obtaining an adequate supply of chemists and chemical engineers. The American Institute of Chemical Engineers is to be congratulated on the action taken at the recent Cincinnati meeting bringing to Mr. Roosevelt's attention the seriousness of the manpower problem in our industry.

In the Institute's communication to the President and to Dr. E. C. Elliott, Chief of the Professional and Technical Division of the War Manpower Commission, it is suggested:

(A) That the loss of technically trained men from war production plants be stopped by cessation of voluntary enlistment or by a "freezing" order covering such personnel and plants.

(B) That selective service occupational Bulletin No. 10 of last June be reaffirmed in principle in its provisions for the deferment of men in engineering training.

(C) That this Directive be modified in the light of the lower draft age by providing for the deferment of engineering students in established colleges to the end of the term in which they reach the age of 18, and thereafter, on a term by term basis as long as their academic records remain satisfactory.

Particularly convincing are the figures quoted which show that the number of young men reaching age 18 is about 3,000 per day and the capacity of the engineering schools for entering students is about 40,000 per year. Hence less than two weeks supply of young men would be sufficient to insure an output of the normal number of young engineers each year. Obviously the total would be greater were chemists included, but if some such over-all plan for all chemists, physicists, engineers, etc., was adopted it would deprive the armed forces of but a very small percentage of the total young men in the 18-20 age group, and would, on the other hand, provide industry in the next few years with a supply of highly technically trained men who must be made available to carry out the vast production plan vital to the successful prosecution of the war.

It is important, we believe, to point out that both in England and in Canada the policy of holding well qualified students in chemistry and engineering in the colleges and universities has been rigidly adhered to through three years of war. If we do not adopt a somewhat similar policy not only will our war effort suffer from a lack of adequately trained personnel, but we will find ourselves at a distinct disadvantage in a competitive sense in the post war period.

In Washington, at least in certain quarters, there appears to be some recognition of the seriousness of the technological manpower situation, but unfortunately like much of the New Deal legislation in the past the cure proposed is a lot worse than the disease itself. Elsewhere in this issue is reproduced the so-called Kilgore Bill entitled "To establish an Office of Technological Mobilization, and for other purposes." We urge every reader of this publication to read this suggested measure. In our humble opinion it is the most dangerous piece of skullduggery yet to be suggested. It is proposed as a measure to help win the war. If it were passed it might well be the means of our losing it. Careful reading of the bill will convince any fair-minded person that what it really intends to do is to socialize and sovietize *all* research. Write your congressman and senators today.

EDITORIAL

Walter J. Murphy, Editor

Accidents Sabotage the War Effort: Last year sheer waste of accidents cost 480,000,000 precious man-days of industrial labor. In spite of the precautions taken by industry to guard against accidents, there were in the first ten months of 1942 over 43,000 fatalities among war production workers. Most of these it is true occurred off the job, but the number is almost equal to the number of killed, wounded, taken prisoner, and listed as missing among our armed forces up to approximately the start of the North African campaign. Only one out of eight industrial establishments—there are 196,000 in all—is fully covered by a safety campaign.

There is under way a campaign to raise funds ($5,000,000 is the goal set) to help the National Safety Council in its effort to reduce this terrible toll of life and its detrimental effect on the war program and it deserves the financial aid of every industrial concern in this country. William A. Irvin, former President of the United States Steel Corporation, has accepted the chairmanship of this drive to finance a nation-wide expansion of safety activities. The Treasurer is Thomas W. Lamont of J. P. Morgan and Company.

A national committee of more than 600 members has been formed, with an executive committee of 74—both made up of senior executives in nationally prominent firms. A preliminary canvass through the national connections of major companies has yielded above one million dollars in cash and nearly another in oral commitments. At present, regional campaigns are getting under way in major industrial centers from coast to coast. The National Safety Council has worked out a very careful plan for putting the $5,000,000 to work. Support this work with your dollars even though your company may be sponsoring a company safety campaign. We're all in this together. The War Production Fund to Conserve Manpower must have wide-spread support.

Today, with the destiny of the world bound up in war production, our course in this campaign must be unswerving. The surest augury of ultimate success lies in the fact that American industry—accepting a full share of the challenge of accidents—is dedicating itself wholeheartedly to the task.

Chemical Research to Save Lives: The Boston night club fire, which resulted in the death of more than 500 people, stresses our ignorance of the chemical composition of one of the commonest of substances—the smoke given off by a fire in ordinary combustible materials.

In speaking of the Boston fire, Dr. Timothy Leary, Suffolk County (Mass.) Medical Examiner, stated: "There is no question that there was something poisonous in that smoke besides carbon monoxide and flame. People died too quickly to fight for their lives."

A clue to what that "something poisonous" might have been has been given us by Dr. John C. Olsen of the Polytechnic Institute of Brooklyn. He found that irritants, such as acetic acid, are generally given off by burning cellulosic material, and that such gases as hydrocyanic acid, hydrogen sulfide, ammonia, and sulfur dioxide may be produced in toxic concentrations by fires involving rubber, silk, wool, and, probably, other complex organic materials. (Reference: "Gases from Thermal Decomposition of Common Combustible Materials," by Olsen, John C., et al., Ind. & Eng. Chem., Vol. 25, p. 599, June, 1933.)

But Dr. Olsen would be the first to point out that his work on the composition of smoke and fire gases (believed to be the only systematic study of the kind) barely scratches the surface of the subject.

Because of the large number of burnable materials and the varying conditions under which they can burn, an immense field for research lies open here.

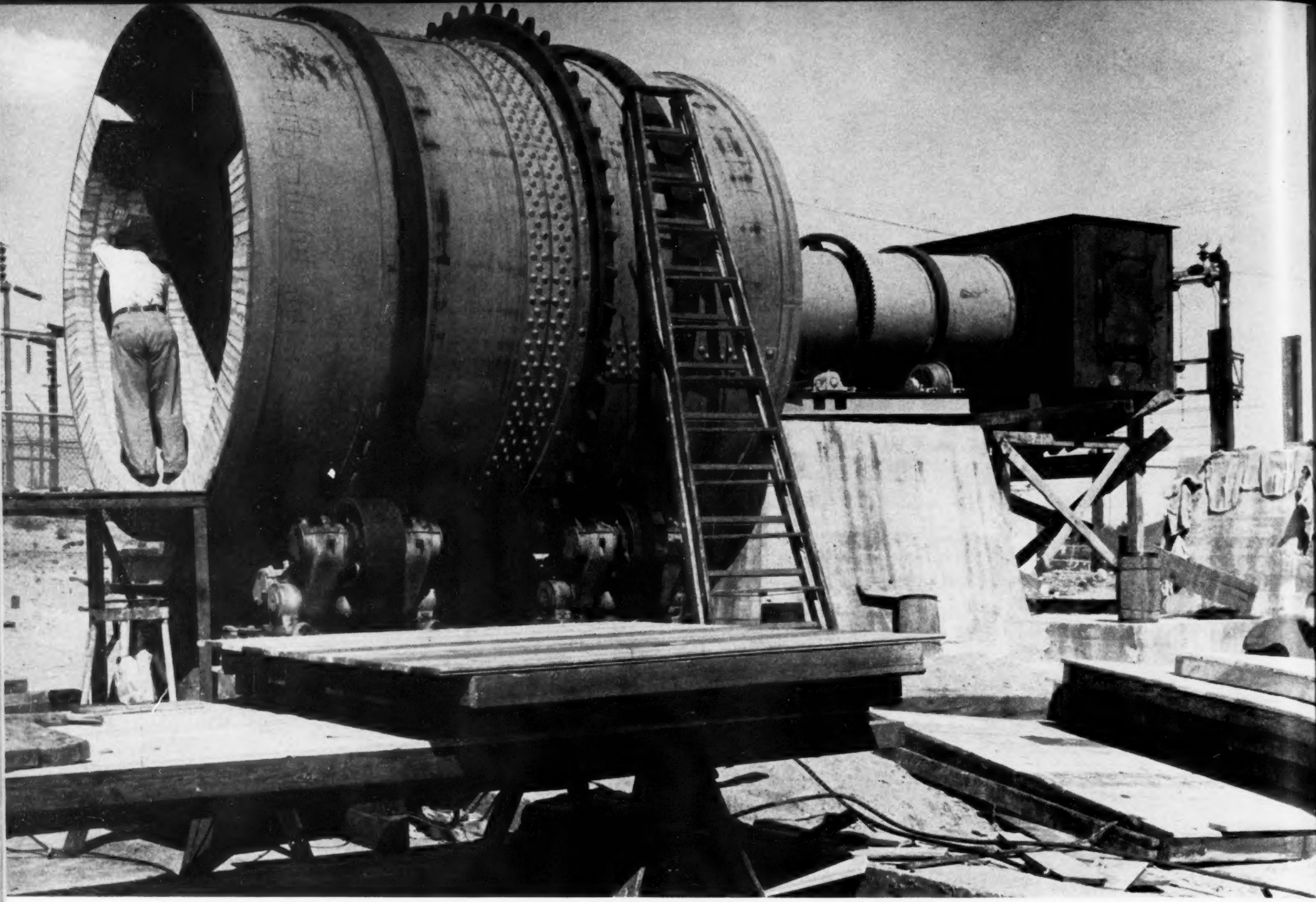
And for years fire protection engineers have been calling for this research. They have long sought to account for deaths that occur in burning buildings but so far away from the actual fire that neither intense heat nor suffocating concentrations of carbon monoxide could possibly reach the victims. "The first step in preventing deaths from suffocation under fire conditions should be a more complete knowledge of the reasons for these fatalities," declares an authority on the subject of fire protection. (Reference: Editorial, Quart. Nat. Fire Pro. Assoc., Vol. 32, p. 95, Oct., 1938.)

It is understood that plans for a comprehensive study of smoke and fire gases have been made at various times within the past ten years, but nothing has been accomplished. Perhaps, however, the Boston tragedy will incite to action.

When more than 100 people were killed by nitrous fumes in the Cleveland Clinic Hospital fire, which occurred in 1929, the chemical hazards of X-ray and other photographic films were quickly evaluated (Reference: Brown, E. W., U. S. Naval Med. Bull., Vol. 28, p. 523, 1930) and steps were taken everywhere to eliminate this particular danger.

Similarly, the Boston night club fire should lead to exact knowledge of the chemical hazards of other materials. Then it will be possible for our scientists and engineers to devise measures that will save thousands of lives every year.

Frederick M. Becket: Elsewhere in this issue the scientific achievements and the many honors received by the late Dr. Frederick M. Becket are reviewed in detail. But Dr. Becket was much more than an outstanding scientist whose notable contributions particularly to the metallurgical field brought renown both to him personally and to the company he served so faithfully and so well. He was a great humanitarian—not in a spectacular manner, but with a quiet dignity which inspired all who had the good fortune to know him even casually. His depth of understanding of the problems of others, the warmth of his genial disposition, and his characteristic self-effacement were so pronounced and so generally recognized that it is not difficult to understand why so much of his time and energy were devoted to helping others. The editors of this publication and its readers have suffered an irretrievable loss. As a member of the Consulting Editorial Board of CHEMICAL INDUSTRIES, Dr. Becket was personally responsible for many of the innovations and improvements initiated in the past decade.



Two-diameter rotary kiln for reduction roasting of high-iron chromites in the chemical beneficiation pilot plant at Boulder City, Nevada.

STRATEGIC MATERIALS

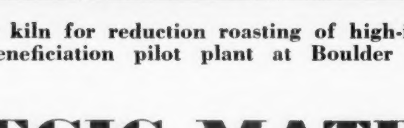
from low-grade and complex domestic ores

By* Dr. R. R. Sayers, *Director, Bureau of Mines

LOOKING ahead to a possible curtailment of some of the strategic, critical and essential minerals as the result of shipping restrictions likely to be imposed by the outbreak of war in Europe, the United States a few years ago began making plans to find other sources of supply or suitable substitutes for the raw materials normally imported from foreign countries.

Attention was focused upon the subject in 1939 when the Strategic Minerals Act was passed by Congress and signed by the President, and when the Army and Navy Munitions Board identified antimony, chromium, manganese, mercury, nickel, tin, and tungsten among the "strategic" minerals.

Two obvious and interrelated courses were open in approaching the problem. The first consisted of building up sufficient stockpiles of the strategic minerals to tide the country over the anticipated critical period. The second course involved the investigation and exploration of domestic mineral deposits and the development or improvement of metallurgical processes for utilizing low-grade ores which were to be found in our own country.



Dr. R. R. Sayers

It was in the second field that the Bureau of Mines was authorized to begin operations, with specific duties being assigned to it by Congress. The Bureau was to rely on the experience of more than 30 years in the conservation and development of the Nation's mineral resources, to employ some of the exploratory and metallurgical methods evolved over the years, and to develop new methods and processes.

Reiteration that the entrance of the

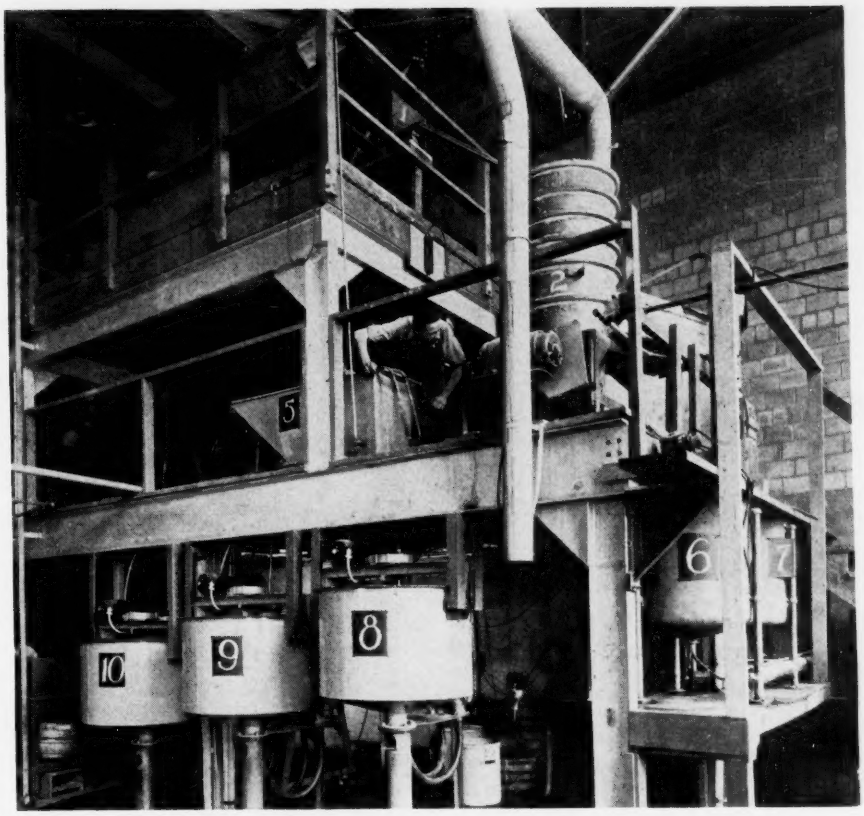
United States into the World War II emphasized the need for maintaining adequate supplies of raw materials for making airplanes, tanks, guns, ships, and other fighting equipment, is scarcely necessary. It was evident at that time that there were insufficient raw materials and products on hand or in sight for making engineering metal, and that adjustments and revisions of previous estimates were necessary.

Before describing the Bureau's work in the metallurgical development of low-grade ores for wartime use, it might be well to tell briefly of the exploration and investigation of domestic mineral deposits which began in August, 1939, and has been pursued diligently right up to the present time. A number of important discoveries of strategic ores have been credited to the Bureau, especially with regard to chromium, manganese, mercury and tungsten, and additional supplies of ore have been located in deposits that already were being worked.

Because of the importance of manganese in the manufacture of steel and since more than 90 per cent of our manganese requirements were imported prior to the war, particular attention was devoted to the exploration of known vast deposits of low-grade manganese ores and manganiferous materials throughout the country. The production of a ton of steel requires approximately 12 pounds of manganese, and it is used in larger quantities for the manufacture of special steels having desirable properties for certain uses. Manganese imparts to steel a good workability which enables the product to undergo forging, rolling, and other processes without being torn or otherwise damaged. Manganese also improves the quality of the product and gives it the ability to perform satisfactorily under various conditions after it leaves the manufacturing plant.

Engineers were sent out to drill, trench, dig, and otherwise investigate the quality and extent of such deposits. More than 500 manganese showings have been examined and about 135 bulk samples of from 2 to 10 tons each from that many deposits have been shipped to Bureau of Mines experiment stations for ore-dressing and metallurgical tests. As of December, 1941, 18 manganese exploration projects, some of which involved work on more than one deposit, had been completed and eight more were in progress.

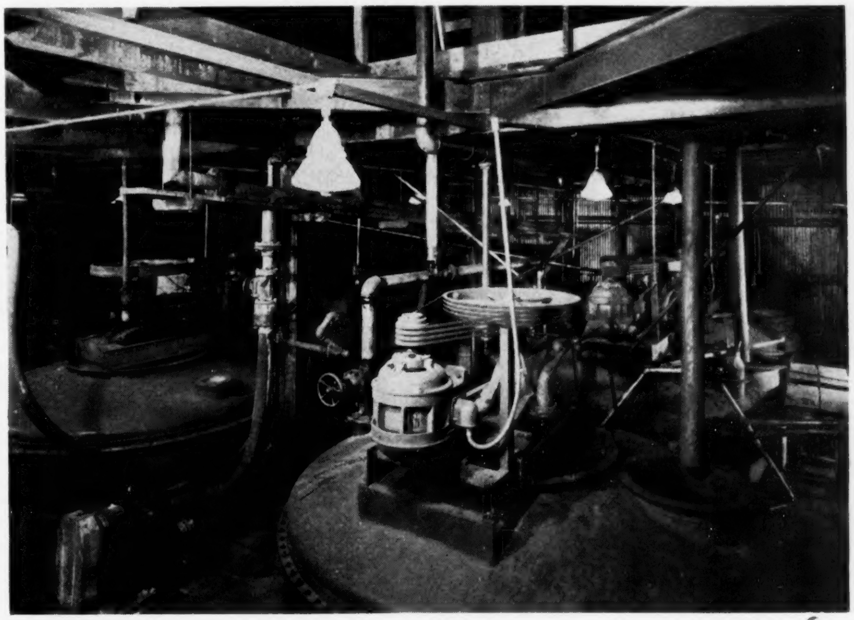
A resume of the Bureau's work in manganese alone disclosed the existence of large deposits of ore in several states. These deposits contained sufficiently large raw materials that in January, 1942, the Department of the Interior through the Bureau of Mines established 11 beneficiating plants of different types in eight separate states. It is believed that enough manganese can be produced to make the United States entirely independent of foreign imports.



This pilot plant for producing alumina from domestic clays, alunite and other aluminiferous materials by acid leaching is now in operation at Salt Lake City by the Bureau of Mines.

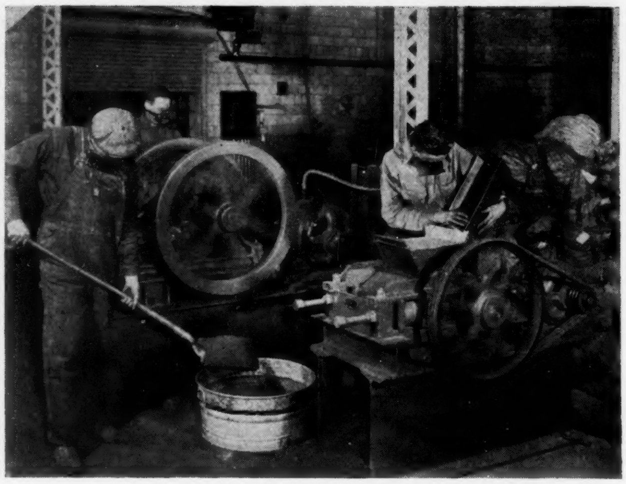
The largest and most important discovery of tungsten ore in the history of the United States occurred in 1941 when the Bureau of Mines located and explored a vast deposit in Idaho, containing several hundred thousand tons of high-grade tungsten ore. Production was started there in August, 1941, and this deposit is supplying some of the Nation's wartime requirements. Total tungsten reserves of the Nation have been augmented by more than a million tons of ore as the result of the Bureau's work.

Chromite exploration since 1939 has



Mechanically agitated leach tanks in a Bureau of Mines hydrometallurgical pilot plant.

A view of the chemical laboratory in the Bureau of Mines experiment station at Boulder City, Nevada.



Crushing and grinding manganese ores at the Bureau of Mines Salt Lake City laboratory for ore-dressing tests.

turned up several million tons of chromium ore in Montana, California and Oregon. Three of the properties are already in production.

As for the other strategic minerals, the Bureau estimates that it has added several million tons to the estimated reserves of antimony, mercury, iron ore, bauxite and high-alumina clay.

In conducting experiments for the utilization of low-grade ores at its various laboratories and pilot plants, the Bureau of Mines has borne in mind that ore-dressing methods are the most practical and require the least capital investment. Therefore, wherever possible, it has tried ore-dressing in treating the different types of low-grade ores to obtain products that can be used without upsetting the existing production facilities and practices.

However, some of the large deposits of low-grade ores do not respond satisfactorily to ore-dressing, and there have been other instances where a new type of raw material required the development of new or modified smelting or other reduction processes. In such instances, chemical and smelting methods have been employed.

Just as in the case of exploration and investigation, the Bureau has directed the greater part of its metallurgical research toward the development and improvement of processes for treating manganese ores. The usual ore-dressing methods, including ones that have been used in the past and others that have been developed by the Bureau, have been employed wherever and whenever practicable. These are the simple washing and screening, gravity processes such as jigging and tabling, and flotation.

It might be added here that the Bureau of Mines has been a pioneer in applying to manganese ores—both oxide and carbonate—the flotation method whereby the manganese mineral is floated, leaving valueless gangue minerals, usually silica, as the tailing. In recent years the Bureau has developed the use of cationic flotation reagents to float the gangue mineral rather than the manganese. Laboratory and pilot plant tests show that this method is effective for concentrating a number of the manganese ores which are not amenable to treatment by other ore-dressing methods.

When ore-dressing methods failed to produce results in the treatment of manganese ores, of course the Bureau resorted to hydrometallurgy or pyrometallurgy, and to the electrolytic method which it had successfully introduced in 1938 after several years of experimentation.

The first funds for conducting manganese experiments became available under the war program in October, 1940, and the Bureau began to expand laboratory facilities and to build pilot plants for large-scale tests. The various phases of the program were distributed among the Bureau stations as follows: ore-dressing studies of western manganese ores, Salt Lake City, Utah; ore-dressing studies of eastern manganese, Rolla, Mo.; hydrometallurgical studies of domestic manganese ores, Salt Lake City; smelting of carbonate and oxide ores, Salt Lake City and Boulder City, Nev.; recovery of manganese by the sulfur dioxide leaching process, Reyerson modification, Minneapolis, Minn.; operation of pilot mill, Boulder City, Nev.; operation of pilot mill, Chamberlain, S. D.; operation of hydrometallurgical pilot plant, Boulder City; and operation of electrolytic pilot plant, Boulder City.

A large number of hydrometallurgical methods have been proposed in the past for extracting manganese from low-grade ores, and the Bureau has made an intensive study of promising well known processes and innovations. These include the percolation leach, using sulfurous and sulfuric acids as lixiviants; the sulfating bake, using the metallic sulfates and sulfuric acid as reagents; the ammonium sulfate leach; the ammonium sulfate roast, which is similar to the sulfate bake but applicable to ores high in lime; the nitric acid process for carbonate ores; and a process which uses nitrogen peroxide as the reagent. A 25-ton hydrometallurgical plant was placed in operation last Fall at Boulder City, Nev., to provide solutions for electrolytic production of metallic manganese and to recover high-grade manganese oxide by leaching low-grade ores.

Matte smelting as applied to several ores that do not respond to ore-dressing treatment is being investigated by the Bureau. By this process, manganese oxide or carbonate ores are smelted with the sulfide of iron or copper to recover these metals as crude metal and the manganese as the sulfide in a high-grade matte. By sintering, the sulfur can be largely eliminated from the matte, leaving a high-grade manganese oxide product.

The manganiferous material in the Chamberlain, S. D., district is the largest known deposit of manganese in the United States. It consists of nodules containing about 16 per cent manganese disseminated throughout the shale matrix that contains very little manganese. Two treatment problems are involved—the recovery of the manganese-bearing nodules, and the treatment of these nodules to recover the manganese in a usable form. Based on laboratory experiments, a pilot mill was constructed by the Bureau at Chamberlain last year to test methods for recovering the nodules. Among the methods tried were crushing and kiln-drying followed by screening, explosion-shattering followed by screening, and crushing followed by hand-picking, as well as combinations of these methods. Tests are also being made at the Rolla, Missouri, station, on the separation of the more dense nodules from the shale by the float-and-sink method.

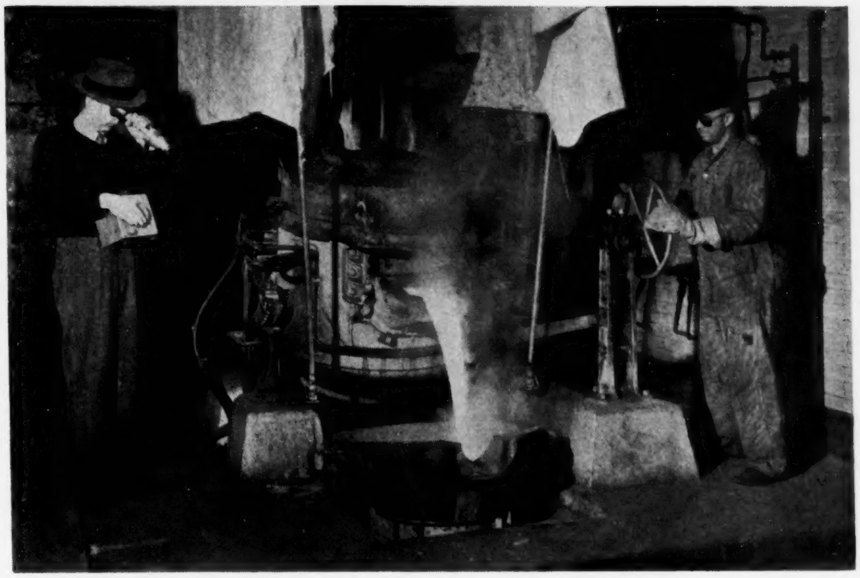
The production of electrolytic manganese has been the object of many inves-

tigators but their work, as indicated by available literature, did not prove successful. Between the years 1935 and 1938, Bureau of Mines metallurgists worked on this problem and finally solved it. In July, 1938, the Bureau announced the first information on the successful electrolytic plating of manganese, and the discovery—patented and assigned to the Secretary of the Interior—subsequently has been adapted to manganese ores other than those of the West, where the original experiments were conducted. The Bureau's process was suitable for commercial operations with the result that the Electro Manganese Corporation constructed a small plant in Tennessee, and today is the only commercial firm in the world producing electrolytic manganese.

The desirable features of the Bureau's electrolytic manganese process are as follows: (1) the metal can be produced from low-grade domestic ores which ordinarily are valueless as ferromanganese ores; (2) the metal is pure, assaying not less than 99.9 per cent manganese; (3) estimated cost of approximately 10 cents a pound in large scale operations as against about 36 cents a pound for less pure thermite manganese; and (4) it can be used in making a wide range of useful superior alloys.

Since the development of the electrolytic process, the Bureau has continued its investigations in order to improve and perfect the process. The Bureau considers it one of the most promising means of relieving this country from dependence upon foreign sources for manganese.

The Bureau of Mines is convinced that there are enough known manganese ores and suitable processing methods to make the United States self-sufficient in the matter of manganese. This is based upon former knowledge of existing deposits and upon the exploration and metallurgical work which the Bureau has undertaken since the beginning of the defense and war program in 1939.



Electric furnace for the matte smelting of domestic manganese ores shown in operation. In this test furnace of the Bureau of Mines, manganese oxide or carbonate ores are smelted with the sulfide of iron or copper to recover these metals as crude metal and the manganese as the sulfide in a high-grade matte.

Some of the larger manganese deposits which have been subjected to study by the Bureau include the oxide ores in Nevada, Utah, California, New Mexico, and the Chamberlain, South Dakota, deposit; the wad ores in the Batesville, Arkansas, area; and the manganiferous iron of the Cayuna range in Minnesota.

Domestic chromite ores are readily concentrated by established gravity methods, but the chromium mineral obtained in the concentrate usually is too high in iron to permit its direct use in manufacturing the war materials to which the chromium imparts toughness and resistance to corrosion. For several years the Bureau of Mines has been carrying on investigations and tests to develop methods of reducing the iron content in domestic chromium minerals.

Since the largest domestic chrome ore reserves are those found in Montana, it might be well to recount briefly the Bureau's experience and success in the chemical beneficiation of these ores. This work has proceeded along three general lines; (1) to develop methods for mechanical concentration of the ores, (2) to develop a simple metallurgical treatment for selectively removing the iron from the concentrates, thereby making a product suitable for the manufacture of standard ferrochromium, and (3) to develop a process for producing pure chromium metal by electrolytic methods.

The first types of treatment tried were various smelting procedures, which were only moderately successful. A study was made of selective reduction at temperatures below the melting point, and next there followed a series of crucible tests under carefully controlled reducing condi-

Manganese pilot mill where tests on the concentration of manganese ores by flotation methods are conducted.

Bureau of Mines chemists and metallurgists making flotation tests of manganese ores in the laboratory at Salt Lake City.

tions by heating a mixture of chromite concentrates and crushed petroleum coke in a covered graphite crucible.

After the preliminary investigations were completed, the Bureau erected an experimental rotary kiln for reduction roasting to convert the iron to a soluble form as the first step toward pilot plant operation. Several difficulties were encountered in the operation of the first kiln, so a second small, batch-type, direct oil-fired rotary kiln was constructed and tests were made. These were so encouraging that a larger kiln was designed and erected.

After preliminary tests in the acid leaching of the reduced iron from the sinter had been conducted, the Bureau metallurgists designed a pilot leaching plant and continued their experiments. Consequently, a leaching system of single stage concurrent leaching in a series of three agitator tanks followed by three stage countercurrent washing of the residue was designed.

Conclusions regarding the beneficiation of the Montana chromite concentrates are summarized in the following excerpt from a preliminary report:

(1) Low-grade domestic chromite concentrates have been roasted in a reducing atmosphere and selective differential reduction of the iron has been obtained.

(2) The reduced sinter produced by reduction has been leached with acid to remove a portion of the iron, thereby producing a residue with a high Cr:Fe ratio for smelting into an acceptable grade of ferrochrome.

(3) The over-all chromium recovery for the reduction roasting and leaching treatment is 98 per cent. The acid efficiency of the leaching system is 95 per cent.

The Bureau has also developed a method for the production of high quality electrolytic chromium metal from low-grade domestic chromite ores, which involves electrolytic deposition of chromium metal from a chromic sulfate solution. A small-scale pilot plant has been erected and is operating satisfactorily. In its conclusions on this subject, the Bureau reported that high current efficiencies and low energy consumptions are characteristic of chromic sulfate-ammonium sulfate-sodium sulfate-electrolytes, and that the industrial hazard arising from the use of chromic acid plating baths has been eliminated from the electrowinning of chromium.

Because of the limited reserves of bauxite in the United States, the Bureau of Mines believes that the only way to maintain the present production rate of metallic aluminum is through the utilization of the abundant raw material sources of clays and shales. A great deal of work on alumina recovery has been done in various states and in a number of experimental laboratories by the Bureau of Mines.

Perhaps the most important phase of this work has been the study of an improved acid process for extracting an alumina of sufficient purity for aluminum reduction. A pilot plant is nearing completion for large-scale tests of this process.

The Bureau also has conducted investigations of the concentration by ore-dressing methods of low-grade bauxites and of chemical and smelting treatment methods for the preparation of pure alumina from high-silica bauxite.

Several years ago the Bureau demonstrated that certain of the Washington magnesite deposits could be concentrated by flotation. However, it has become apparent that most magnesium processes which use magnesium oxide as raw material require an oxide of higher purity than that obtainable by the concentration of domestic magnesite. At present the Bureau is conducting pilot plant tests of chemical methods for obtaining magnesium oxide from both dolomites and magnesites.

The electrothermic reduction of magnesium oxide with carbon and the shock-cooling of magnesium vapor with oil or liquid hydrocarbons have been investigated by Bureau metallurgists for some time. This is being continued on a small pilot plant scale, principally with regard to the continuous redistillation of the impure metal from the reduction step. Tests also are being made of a process for the electrothermic reduction with carbon and absorption of the magnesium vapor in a molten metal, from which it is subsequently recovered.

Methods for the utilization of olivine as a source of magnesium also are being investigated. Numerous dolomite deposits throughout the country, as well as the large magnesite deposits in the Pacific Northwest and the Southwest are potential sources of magnesium.

Within the past few weeks a program was launched for the large-scale testing of low-temperature reduction methods for producing sponge iron in order to augment the supply of scrap needed in steel-making furnaces and to increase the capacity of existing blast furnace plants. Although the Bureau and other research groups have in the past demonstrated several processes that have promise of commercial applicability none has ever been used on a commercial scale in this country. A laboratory and pilot plant is to be erected in Wyoming to conduct sponge iron tests. Tests will also be made at other locations.

Regarding the treatment of complex zinc ores, the Bureau plans to build a pilot plant to investigate the use of methane or natural gas in the reduction of zinc ores which are difficult to handle by existing methods.

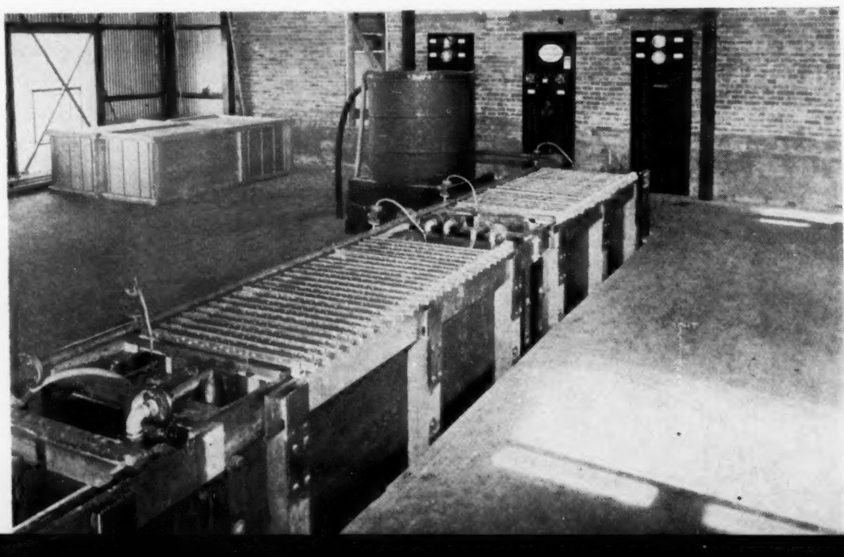
Numerous investigations have been conducted to determine the amenability of tungsten and mercury ores to metallurgical treatment. Many other mineral products normally supplied by imports, such as flake graphite, mica and asbestos, have been the subject of exhaustive study by the Bureau in the attempt to increase domestic production by the testing of ores and the development of suitable processes. Space does not permit a full discussion of these other products.

Practically all of the Bureau's efforts are now directed toward the goal of developing minerals and processes to provide adequate supplies of metals and minerals for winning the war. The major portion of this work may be divided into two main groups.

First, there are the war minerals projects, with the objective of obtaining all data and pointing out where the development for production is warranted. Samples are tested to determine the most suitable metallurgical treatment, which in most cases is ore-dressing. The Bureau also determines where mining operations can begin and recommends construction of mills where required.

The second group consists of the process projects, or the development of needed processes for treating domestic ores or for producing needed minerals and metal products. After the development of a process, its use in the treatment of specific ores is determined.

Electrolytic cells shown here are a part of the Bureau of Mines electrolytic manganese pilot plant which is now in operation at Boulder City, Nevada.



BETWEEN THE LINES

Plastics and synthetic resins are playing an important role in World War II. Production generally is sufficient to adequately meet military demands but civilian uses are being curtailed in most instances. Several bottlenecks in raw materials have appeared and others are likely to develop in the not too distant future.

IT is no military secret that plastics are in the war. Even the non-flying layman is familiar by now with the combat pilot's name for his transparent covered cockpit, his "greenhouse"; or the pictures of various sizes and types of flying bombers, showing the transparent noses through which pilot or bombardier can see to do his work. Hence plastics, within certain defined limits, have been under control of the Chemicals Division of the War Production Board. The organic plastics and resins section, which directly handles the war problems involved, is under Dr. R. H. Ball.

This control embraces the tar acid resins and plastics, urea and melamine resins, cellulose esters and ethers, the acrylate and methacrylate resins, polystyrene and vinyl group of resins. The problem, so far as the war is involved, has been to meet overwhelming war demands in the face of an insufficient number of plants for the synthesis of resins and plastics, as well as basic chemical shortages in many cases.

The plant situation is crystallized in Dr. Ball's statement recently that "It looks as if we will have to get our supplies from the plants already built or building."

Adhesive Resins Plentiful

In the case of adhesive resins, productive facilities for the resins and raw materials are stated to be ample to meet essential requirements, and even provide for expanded output to a considerable degree. On the other side, the melamine resins, probably because of their more recent introduction have been fairly easy to supply hitherto, because they were only slowly drawn into war uses. Now because their uses are accelerating, a shortage threatens.

To expand output here, new capacity would have to be found, as the production has been rather small. This illustrates another phase of the problem that has confronted the division; a few large volume uses can transform a situation of fairly free supply to a real shortage, overnight. While applied here to melamine, it is a representative contingency. In the case of this plastic, due to the limited productive capacity for melamine, a rather precarious position is indicated in the case of melamine-formaldehyde plastics.

Basic Raw Materials

As to basic chemical raw material shortages, the major ones are phenol, cresols, cresylic acid and furfural for tar acid resins; benzol for polystyrene; nitric acid for nitrocellulose; phenol and cresol for triphenyl phosphate and tricresyl phosphate plasticizers. In addition, while not serious yet, or at least very serious, there are shortages of ammonia for urea, cotton linters for the cellulose esters, and phthalic anhydride and octyl alcohol for phthalate plasticizers. A number of other chemicals needed in plastic manufacture are not plentiful, but due to their important war uses in plastics, not much difficulty is anticipated in getting sufficient quantities of the raw materials involved.

As reported, the plastics supply falls under three headings; those which are available in fairly easy quantity for civilian use—urea-formaldehyde, cellulose acetate and cellulose acetate butyrate; those highly restricted even for military purposes — cresol-formaldehyde laminates, methacrylates, and vinyl resins; and those falling somewhere between these extremes —a number of intermediate classifications being headed toward critical categories, even so.

In the list of more than $50 million worth of scarce chemicals allocated to industry for use during the past month, which do not include direct military needs, a casual check shows that non-military users of butyl alcohol for resins and plastics were given 70 per cent of requested amounts; benzene for manufacture of phenol was granted to the full requested amounts; chemical cotton pulp for manufacture of plastics, 87 per cent of requested amounts; glycerine for manufacture of alkyd resins on ratings of A-2 or higher, in full, other requests, 88 per cent: for manufacture of plastics, in full; phenol for plastics, in full on ratings of AA, 30 per cent on ratings A-1a to A-1k; in full for manufacture of cresol and cresylic acid on ratings of AA, and on ratings A-1a to A-1k, 40 per cent; phosphate plasticizers were denied for all civilian requests.

The majority of plastics entering primarily critical uses are short if both military and essential civilian needs are considered. The above-mentioned list of allocations stressed the end use of the product rather than the ratings involved. Due to lack of adequate production facilities to meet current needs in many instances, as well as the lack of raw materials for their synthesis the supply of many such plastics is not even sufficient for war use.

Hard to Define Shortages

On this point however, Washington officials find it difficult to answer categorically some questions as to whether there is a shortage of a particular raw material. There are qualifications to such answers. Thus most of the raw materials involved in plastics manufacture also enter other chemical production. This calls for discriminatory uses, according to the essentiality of the product and the possibility of substitution of raw materials here and there, among the various demands. Each plastic, in short, is viewed as a separate problem.

To date, through one method or another, it is claimed that essential military needs have been provided, though non-military requirements, even at a minimum, have not been met as successfully. Sometimes civilian needs, as such, are almost as vital as any other uses; thus a certain minimum quantity of phenolics enters such uses as power distribution, transportation and communications, as well as war purposes.

The problem in tar acid resins, phenolics, has mainly been chemical raw materials such as phenol, cresol, and cresylic acids. Phenol enters ammunition production, so that while new plants have been constructed, the supply has still been short for phenol-formaldehyde plastics. For this reason only the most vital civilian needs in addition to military requirements, are being filled. There is some hope that phenol production will be stepped up sufficiently to meet increased military demands, which would permit substantially the same division of supplies as at present. Furfural, entering certain phenolic resins, likewise is short, and to some extent formaldehyde is being substituted where possible.

Cotton Linter Supply

Another tight situation is found in the cotton linter supply, with the expectation that henceforward nitrocellulose plastic will be available for very essential requirements. The prospect also is for the output to continue on the present low scale. The supply of cellulose acetate plastic is not expected to equal demand from civilian users, but for other uses, as in production of gas masks (molded parts) and in X-ray film, barring an in-

(Continued on page 908)

What Are Raw Materials?

By F. Fromm, *Chemistry Department, Polytechnic Institute of Puerto Rico*

A REVIEW of the more recent books and articles on raw materials, their use and their importance reveals the surprising fact that most of the authors do not bother about giving a definition as to what they consider as raw material. A survey of the commodities treated in these books shows clearly that there is all but clarity on that point or an agreement about the goods to be considered. In Table 1 some of the more striking contrasts are compiled. For the matter of simplicity commodities like ores, coal, mineral oils, etc., the raw material quality of which is generally acknowledged, are omitted.

Table 1

Commodity	Books treating it as raw material
Cereals	1) 3) 4) 5) 7) 9) 10) 11) 12)
Flour	1) 3) 7)
Oil Fruits	1) 3) 5) 6) 8) 9) 10) 11) 12)
Vegetable Oils	1) 3) 5) 8) 9) 11)
Sugar	1) 4) 5) 7) 8) 9) 10) 11) 12)
Milk	1) 7) 10) 11)
Animals	1) 3) 5) 7) 8) 10) 11) 12)
Hides	1) 2) 3) 5) 6) 7) 8) 11) 12)
Artificial Fibers	5) 7) 11)
Steel	1) 2) 3) 4) 7) 11)
Coke	7) 11)
Energy Sources	1) 3) 5) 7) 10) 11)
Nitrates	1) 3) 5) 6)* 7)* 8)* 9) 11) 12)
Iodine	1) 3) 7) 8) 11)
Camphor	1) 3) 5)* 7) 8) 11)
Opium	1) 3) 8) 11)
Quinine	1) 3) 8) 11)
Wood	1) 2) 3) 4) 5) 6) 7) 8) 10) 11)
Wood Products	1) 2) 5) 7) 8) 11)
Wastes	2) 5) 7) 8) 11)

* including synthetic material.

The analysis of the table leads to two major points of discussion:

1. Some authors exclude whole groups like the foodstuffs or the wastes from their list.

2. There is considerable discrepancy among the various authors as to how literally the adjective raw in raw material has to be taken. While sometimes even synthetic products like rayon or artificial fertilizer are included in the discussion there is doubt in other books whether ores and metals both are raw materials or the metals ought to be taken as products rather than as raw materials.

Apparently, many authors still stick to the definition of raw materials as given nearly 200 years ago by *Ludovici*[13]: "Rohe Waren oder rohe Materialien heissen, welche, ehe sie können zum menschlichen Gebrauch angewandt werden, erstlich Menschenhände erfordern, solche dazu zuzubereiten und geschickt zu machen." (Raw goods or raw materials are called those goods which require human labor to prepare them and make them suitable before they can be used for human purposes.)

The weak point of this definition lies in the different concept the various authors have about the meaning of the clause: before they can be used for human purposes. If the clause is taken literally, only the completely manufactured merchandize could not be called raw material, that is commodities like flour, dyestuff intermediates, etc., had to be considered as raw material. On the other hand, if we include in the "use for human purposes" all industrial processes, then only materials as they are found in nature would be called raw materials; hence, most of the metals, and all wastes, etc., could not be classified as raw materials. But for obvious economic and industrial reasons it seems desirable to have these goods united in the one group of raw materials.

Nevertheless, *Ludovici's* definition was not doubted for more than 150 years and goods like foodstuffs were excluded from the discussion of raw material problems. A change in the concept of raw materials took place when with the progress of commercial exchange the necessity for an international commercial status was felt. *Kioer*[14] suggested that this status was to be arranged in several large groups of merchandize one of which were the raw materials. It was exactly this group which caused most trouble in the discussion of the nomenclature in the following years.

In the course of this discussion two Austrian scholars, *Springer* and *Schilder*[15], published a lengthy paper on the problem. They tried to modify and improve the definition of raw materials by emphasizing the clause: "which require human labor to prepare them" in *Ludovici's* definition which they do not quote. So, they came to the conclusion: "dass es sich um Waren handelt, deren Produktionsstadien vom ersten bis zum letzten aus technischen, klimatischen, wirtschaftlichen etc. Gründen an dieselbe Oertlichkeit gebunden sind." (that they are goods the production of which has to be performed from the first to the last step at the same locality for technical, climatic, economic, etc., reasons.) This definition which tried to give the term as narrow a limitation as possible was all but satisfactory.

Applying it in the strictest sense *Springer* and *Schilder* came to the point where they could not consider metals as raw materials unless they occur in nature in the free state. In the same way they would not classify all the vegetable oils either as raw materials or as products; they listed olive oil as raw material because olives deteriorate rapidly and have to be pressed where they are cultivated, but they called all the other vegetable oils products because the pressing of the oil fruits may be done also at places very distant from the country of their origin. Also coke was for the same reason excluded from the group of raw materials. Furthermore, wastes which represent a rather important resource for modern industry were not covered by their definition. It is obvious that the definition as suggested by *Springer* and *Schilder* puts also artificial or synthetic material like synthetic dyestuffs, rayon, resinoids, etc., in the class of products. A solution which certainly is not justified by their position in the process of manufacturing.

But even if we have to consider their attempt at giving a definition as a failure, their paper remains important because it brings up one essential point for the first time when the two authors state[16]: "Vorallem ist das Missverständnis zu beseitigen, als ob die Rohstoffbezw. Fabrikatsqualität eine den einzelnen Produkten fest anhaftende Beschaffenheit sei, wie etwa die chemische Zusammensetzung oder irgendwelche physikalischen Eigenschaften; denn tatsächlich handelt es sich um Verhältnisse, die mitten im Fluss der wirtschaftlichen und technischen Entwicklung stehen, wobei innerhalb der technischen Entwicklung jene der Transporttechnik begreiflicherweise eine ganz besonders hervorragende Rolle spielt." (Above all we have to avoid the mistake of considering it an invariable quality of a merchandize to be a raw material or a product in the same way as its chemical composition or its physical properties are invariably fixed. As a matter of fact, we have to deal with situations which are continuously changed by the flow of technical and economic development in which the progress in the technique of transportation is especially important.) This relativity of the raw material quality is one of the essential characteristics of a raw material though it is not sufficient to describe a raw material completely and though *Springer* and *Schilder* have not clearly indicated to what the raw material quality is related.

A new attempt to find a better definition

was not made for nearly 25 years. But in practice, a step forward was made when at Brussels in 1913 the *Convention for the Organization of International Statistics of Commerce*[8, 17] modified *Kioer's* suggestion and decided that the international commercial statistics should be subdivided into 5 groups one of them comprising the foodstuffs and beverages and another one "matières brutes ou simplemant préparées." In this group of crude or simply prepared materials were included all the metals (except gold and silver), many wastes, charcoal, wood pulp, etc. Any further discussion where this limit between simple preparation and product ought to be, was postponed.[18]

Also, when during and after the war of 1914-18 raw material problems became more and more important, no discussion of their definition was attempted, but the number of goods included in the investigations was considerably increased and contained two completely new groups, the foodstuffs and the energy sources. *Corrado Gini,* whose report on raw material problems was published in 1921 by the *League of Nations,* has eleven years later returned to the problem. His definition is[19]: "Per 'materia prima di un dato prodotto' si intende in senso stretto, un bene che viene consumato completamente nella preparazione del prodotto in questione e materialmente conglobato nel prodotto stesso (come il cotone greggio nel filato di cotone o il filato di cotone nel tessuto); ma, in senso più largo, anche un bene che viene consumato completamente nell' atto della produzione per fornire ad esso l'energia necessaria, come, nella produzione di molti prodotti, avviene del carbone. Dal che si intende come il concetto di materia prima sia relativo, in quanto quello che è il resultato di un atto productivo (per es. filato) può costituire la materia prima per un atto di produzione ulteriore (per es. confezione del tessuto). Le materie prime possono precisamente definirse 'beni di produzione ad utilizazione istantanea.'" (Under "raw material of a given product" we understand in the strict sense of speaking a commodity that is completely consumed in the process of manufacturing the product in question and that is materially embodied in the same product (like raw cotton in the thread or the thread in the tissue); but also in a broader sense of speaking a commodity that is completely consumed in the process of production so as to furnish the energy necessary for this, that is as the coal in the manufacture of many products. From this we learn that the concept of raw material is a relative one in so far as the result of one process of production (e.g. thread) may be the raw material for a further process of production (e.g. manufacture of tissue). The raw material may be defined exactly

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as "industrial goods for immediate utilization.")

The inclusion of foodstuffs and energy in the list of raw materials is also found in *W. S. Culbertson's* book[20] who unfortunately has not condensed his view to a definition.

Remarkable in *Gini's* definition is the fact that he retains the idea of the relativity of the term and emphasizes and extends it much more than *Springer* and *Schilder* did. In fact, considering thread and the like as raw material and discarding the term of intermediates he goes further than any other author in this field has gone. But if one considers that a study of raw materials deals with the investigation of the material supply needed for the maintenance of life and production in a country, one has to admit that *Gini's* definition has its merits even if it goes very far. Further, he has not given a clear idea as to what relation determines the raw material quality of a given commodity. The inclusion of energy seems partially to be justified by his definition, but energy is beyond doubt not a material and also the use of water power is not covered by the statement "a commodity that is completely consumed in the process of production." The introduction of foodstuffs in the raw material group was already for a long time a necessity for economists and technicians. Here, *Gini's* work definitely means a step forward.

Idea Accepted at Once

As a matter of fact, his idea in this respect was accepted at once. The following reports on raw material problems as given by the *League of Nations*[21] as well as an investigation performed by the *Royal Institute of International Affairs*[22] include foodstuffs, but omit energy. They do so more for practical political and economic reasons than for scientific considerations.

This is the more to be regretted as already in 1933 *E. W. Zimmermann's* book[23] on World Resources and Industry was published which gives an excellent appraisal of the term stating:

"1. Resources are the environment appraised as to its usefulness to man.

2. Resources are the environment viewed in its relation to human wants and abilities.

3. Resources are the environment functioning to satisfy human wants." *Zimmermann* corroborates his definition by pointing out that, for example, coal has not been a resource as long as mankind did not appraise its value as fuel. Mankind had also to acquire the necessary ability of mining and of constructing stoves and furnaces in order to use the coal; the technical and economic relations had to be established. Finally, the coal had to satisfy the human want for heat, it had in fact to function as a fuel resource.

These three qualities are met in any raw material in the narrowest sense of speaking; but also all the goods mentioned above and not covered by the formerly discussed definitions are included. Wastes for instance are not resources at any rate but only in so far as they are appraised as such. It is exactly to that extent that they meet the definition.

Also the rather difficult question as to how to replace synthetic materials like rayon, aniline dyestuffs, etc., is answered by *Zimmermann's* definition. The widespread habit of calling these goods "artificial or synthetic raw materials" is a nonsense in itself, for a material can be only either raw or artificial. But it cannot be denied that many of these synthetical products are important commodities for industrial processes, commodities which scarcely could be classified as intermediate or auxiliary material. So, the word resource in the sense of *Zimmermann* could also apply to them and give a satisfactory definition where the old term of "raw material" would not lead us to any reasonable result.

The position of these synthetic materials among the resources may be made clearer by a study of another term in this field: replacement. The word replacement, and more so in its German translation "Ersatz," does not sound very well to many people. But there is no reason for any disregard of the material concerned; for most of them are virtually identical with those which we call synthetic products. The difference in naming is due to the fact that in one instance we want to emphasize the convenience and in the other instance we refer to the use; hence, we may say that most of the replacements are not raw materials in

the old and narrow sense of speaking, as *Springer* and *Schilder* already stated, but products of some industrial process and used as resources. In fact, one might classify these replacements as a group named with the *Dupont* slogan: Better things for better living; in industry and economics they do not represent new or synthetical raw materials but the important fact of a shifting in the resource, in the source of material. Examples of this shifting are very numerous in modern times; the *Haber-Bosch* process may be quoted as shifting the world's supply of nitrogen compounds from Chilean nitrate to the air; the use of synthetic indigo represents a shift from the plant extract to coal tar; etc.

It may seem as if the above quoted definition is only based on economic considerations. The stipulations, however, that the environment has to be related to the human abilities and has to function so as to satisfy human wants include all the technical arguments on the subject; for the relative and functional nature of the resources is based only on the availability and usefulness of industrial processes.

Technology Same

In the same way as it was done in general technology[24-26] and the author could point out in the technology of wastes a few years ago[27] we are also able to outline the technology of raw materials with a few general principles. The point of view in these investigations on general and on waste technology was that the decision which procedure should be applied in a given industry was determined rather by the physical properties than by the chemical nature of the substance. The application of this principle on the technology of wastes led to the conclusion that all industrial processes using wastes may be classified in five groups: 1. concentration; 2. mechanical separation; 3. regeneration; 4. chemical separation; 5. complete transformation. These groups correspond to the five sources of wastes, i.e., 1. the spoiling of material; 2. diminuition or dilution; 3. byproducts; 4. rejections; 5. worn out materials.

In an analogous way we may say that the technical research work on raw materials will always proceed along three lines:

1. The finding of new sources of known material. The work along this line mostly does not fall in the field of chemical technology but will be done by the geologist discovering new mineral deposits, the engineer finding ways of using poorer ores or of removing undesirable impurities, by the agronomist increasing the cultivated area or the fertility of the soil or improving the quality or fertility of domestic animals.

2. Improving of the qualities of known raw materials. Examples for this type of true chemical work are given by the creation of new alloys or by the change in qualities as achieved by the mercerization of cotton or the vulcanization of rubber.

3. Use of resources not yet used for this purpose. Here we have the field of replacement technology proper. The technical work can proceed in two different ways:

a) The adaption of raw material similar to that one already applied. e.g., the introduction of aluminum or aluminum alloys in place of other alloys, the use of paper in place of textile fabrics, etc.

b) The use of new kinds or classes of resources which were never used before. Here we have the field of replacements in the narrower sense of speaking, the synthesis of new materials, the discovery ot resources not yet appraised so far like the use of coal as a chemical raw material some 150 years ago or the use of magnesium as a component of alloys in our time.

These groups of technical work could be derived exactly from ***Zimmermann's*** definition: while in group 3 b we deal with the appraisal of a new resource, the emphasis in group 2 and 3 a is laid on the change in the relation between the resource, the human ability, and the human wants. Group 1 represents the case in which the material in question was already appraised as a resource and related to human wants but had not yet started to function in order to satisfy the human needs.

In practice the work on all four of these lines will be performed more or less simultaneously as can be seen, for example, in the field of textile fibers.

We had a marked tendency in many countries of increasing the production of fibers by increasing the number of sheep or cultivating a greater number of acres. At the same time experiments were being performed which would produce a higher yield per unit area of cultivated land or per capita of animal.

The techniques applied for an improvement in quality were biological as well as chemical. A careful selection of the biological material proved itself as very useful, for example, in the work with wool, while an extensive study of the methods of disintegration of the plants was initiated in order to obtain more valuable vegetable fibers. Also the work on the various finishings belongs in this group.

The way of adapting similar materials is followed in the use of new vegetable fibers like the ill-famed nettle fiber and similar plant fibers but has been much more successful in the older adoption of the various tropical aloe fibers like abaca.

The results of the synthesis of textile fibers are too well known to be referred to extensively. But it may be worth while to point out that synthesis here did not only mean one shift in resources but also in its recent development represents a whole series of shifts beginning with the fibrous plant material cellulose and leading into organized animal substances like casein to completely synthetic products as they are used in the production of nylon, etc.

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Committee on Military Affairs Gets Bill For Office of Technological Mobilization

Kilgore Introduces Measure Which Proponents of the Bill Claim Would Use Full Powers of Technically-Trained Manhood as Well as All Technical Facilities, etc., to Win the War.

77th CONGRESS
2d Session

S. 2721

IN THE SENATE OF THE UNITED STATES

August 17, 1942

MR. ROSIER (for Mr. Kilgore) introduced the following bill; which was read twice and referred to the Committee on Military Affairs

A BILL

To establish an Office of Technological Mobilization, and for other purposes.

Whereas the war in which this Nation and the other United Nations are engaged for the preservation of democracy and freedom and the liberation of the conquered peoples is a conflict in which victory highly depends upon the degree of mechanization of the armed forces; and

Whereas the full and immediate utilization of the most effective scientific techniques for the improvement of production facilities and the maximization of military output is essential for the successful prosecution of the war to a sure and speedy victory: Therefore

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this Act may be cited as The Technology Mobilization Act.

Sec. 2. The purposes of this Act shall be—

(a) to regain, maintain, and surpass our previous technical preeminence and attainments; and to make forever secure America's world leadership in the practical application of scientific discoveries, a leadership now gravely threatened by the arms and achievements of the Axis;

(b) to mobilize for maximum war effort the full powers of our technically-trained manhood; and similarly to mobilize all technical facilities, equipment, processes, inventions, and knowledge; and

(c) To accomplish the above objectives—

(1) by breaking the bottlenecks that today choke up these technical forces and result in the diversion of vast amounts of material, time, and effort from war and essential civilian use to less essential and nonessential uses; by making fully available all patents and all applied technical knowledge for full war use;

(2) by fully utilizing the facilities of small business, technological laboratories, inventions and inventors, and maximizing the output of war goods and essential civilian supplies;

(3) by providing adequate supplies of substitutes for goods normally containing critical materials and by discovering and developing new sources of critical raw materials;

(4) by stimulating new discoveries and inventions, developing more efficient materials and products, and improving standards of production; and, in general,

(5) by promoting the use and development of those processes, products, and materials most efficient for the successful prosecution of the war to a speedy and secure victory.

Establishment of Independent Office

Sec. 3. (a) There is hereby created an independent agency to be known as the Office of Technological Mobilization under the direction of a Director to be appointed by the President of the United States, by and with the advice and consent of the Senate, who shall be known as the Director of Technological Mobilization and who shall receive a salary of $12,000 a year.

(b) The Office of Technological Development shall have power to select, employ, and fix the compensation of such officers, employees, attorneys, and agents as shall be necessary for the transaction of the business of the office; and to define their authority and duties without regard to the provisions of the Classification Act of 1923, as amended. All such personnel where employed on a full-time basis shall sever all private business connections.

Mobilization of Personnel and Facilities

Sec. 4. (a) The Office of Technological Mobilization is authorized and directed to have full access to all governmental and private information and to collect such additional information as may be necessary bearing on—

(1) the number, location, qualifications, and current activities of all scientifically or technically trained personnel; including personnel engaged in public or private activity whether or not currently engaged in scientific research and development; and

(2) the number, location, and current use being made of all scientific technical facilities, public or private, in use or capable of adaptation for use in scientific research and development.

(b) The Office is authorized and directed to appraise the current use being made of scientific and technical personnel and facilities, both public and private, and to draft all such personnel and facilities failing to submit or to accept plans for immediate conversion of their efforts to work deemed more essential by the Office of Technological Mobilization. Such personnel as may be drafted for Government assigned and financed work will be compensated at reasonable rates of compensation prevailing for professional, technical, and consultant work and deemed just and fair according to precedents of the Federal service but without regard to the Classification Act of 1923, as amended. All such personnel where employed on a full-time basis on Government-financed projects whether or not working directly for the Office or other Federal agency shall sever all other private business connections.

Development of New and Improved Techniques, Processes, and Products

Sec. 5. (a) The Office of Technological Mobilization is authorized and directed to collect or acquire for reasonable compensation where it deems proper any and all scientific, technical, and other information which it deems may be useful in planning or carrying out the development of a new or improved technique, process, or product; and the Office shall have access to all such information held by public agencies or private persons including full information on current research programs and developments, together with details and characteristics of processes, materials, and products, both military and civilian. Reasonable compensation shall be determined by the Office, subject to review by the courts.

(b) The Office of Technological Mobilization is authorized and directed to review all projects for research and development including practical development of inventions which may be brought to its attention; and it shall promote such projects as it deems appropriate that are consistent with the purposes of this Act; and it shall also initiate through a staff of its own such additional projects as it can, utilizing any or all of the following methods:

(1) Grants or loans to public agencies or private persons for payment of costs

of personnel, supplies, expansion, and erection of additional research facilities, and such other expenses as the Office may determine are essential to the completion of particular projects.

(2) Allocations of needed personnel, facilities, and materials in accordance with sections 4 and 8 of this Act.

(3) Provision of technical, including patent, information collected, acquired, or prepared by the Office.

(4) Establishment of New Research facilities under the direction of the Office.

(5) Erection of pilot plants or other semiworks production facilities.

(6) Assign projects for completion to public agencies or responsible private persons and make necessary grants or loans for conducting such research.

(c) The Office is authorized and directed to review established production facilities, techniques, and products with a view to their improvement (or improved use) including saving of production time and labor, conversion of idle facilities, better utilization of raw material, reduced use of critical materials, improved product characteristics, and such other improvements as may be deemed consistent with the purposes of this Act, and shall develop such improvements through any and all of the methods enumerated under section 5 (b).

Integration of Technical Developments Into the War Production Program

Sec. 6. The Office of Technological Mobilization is authorized and directed (a) to encourage the fullest possible adoption of the most efficient products, materials, and production and service techniques by providing specific information regarding them to the armed services, the War Production Board and to other proper agencies of the Federal Government, as well as to factory officials and technical personnel engaged in war and essential civilian production; and to encourage the adoption of such products, materials, and techniques by providing technical guidance and advice wherever necessary.

(b) To investigate any case in which it is believed producers of war and essential civilian supplies or services are continuing to use inefficient designs, processes or materials: to evaluate the factors affecting such failure to adopt most efficient methods and to present written reports regarding such cases to the War Production Board, the armed services, the Maritime Commission, and other Federal agencies or officials concerned, together with recommendations for appropriate action.

(c) To dissolve hindrances to the voluntary adoption of improved products, processes, and materials by compelling the licensing of all patents, secret processes, and special technical information at reasonable compensation in order to foster their wide utilization, and by taking similar vigorous action in overcoming all other obstructions to maximum technical efficiency in war production. Reasonable compensation shall be determined by the Office, subject to review by the courts.

Sec. 7. The Office shall consult with and advise, on its own initiative or on request, any Government officer or agency or private person regarding research and technical developments, or problems which fall within the purposes of this act.

Sec. 8. The Office shall make representation to the War Production Board for the allocation of critical materials, machinery, and equipment for use for specific research and development projects and all requests for such allocations whether by private or public agencies shall be made only through the Office.

Sec. 9. (a) There is hereby created a body corporate under the name Technological Mobilization Corporation (hereinafter referred to as the Corporation). The principal office of the Corporation shall be located in the District of Columbia, but the Corporation may establish such branch offices in other places in the United States as may be determined by the board of directors.

(b) The Corporation shall have capital stock of $200,000,000 subscribed for by the United States through the Secretary of the Treasury, and payment for which shall be subject to call, in whole or in part, by the board of directors of the Corporation. There is hereby authorized to be appropriated the sum of $200,000,000 for the purpose of enabling the Secretary of the Treasury to make payment for such capital stock when payment is called by the board of directors. Receipts for payments by the United States for or on accound of such capital stock shall be issued by the Corporation to the Secretary of the Treasury and shall be evidence of the stock ownership by the United States.

(c) The Corporation shall not have succession, beyond July 1, 1952, except for purposes of liquidation, unless its life is extended beyond such date pursuant to an Act of Congress. It shall have power to adopt, alter, and use a corporate seal, which shall be judicially noticed; to make contracts; to lease or purchase such real estate as may be necessary for the transaction of its business; to sue and be sued, to complain and to defend in any court of competent jurisdiction, State or Federal; to select, employ, and fix the compensation of such officers, employees, attorneys, and agents as shall be necessary for the transaction of the business of the Corporation; to define their authority and duties, require bonds of them, and fix the penalties thereof; and to prescribe, amend, and repeal, by its board of directors, bylaws, rules, and regulations governing the manner in which its general business may be conducted and the powers granted to it by law may be exercised and enjoyed. The board of directors of the Corporation shall determine and prescribe the manner in which its obligations shall be incurred and its expenses allowed and paid. The Corporation shall be entitled to the free use of the United States mails in the same manner as the executive departments of the Government. The Corporation, with the consent of any board, commission, independent establishments, or executive department of the Government, including any field service thereof, may avail itself of the use of information, services, facilities, officers, and employees thereof in carrying out the provisions of this Act.

(d) The management of the Corporation shall be vested in a Board of four directors to be appointed by the President of the United States and a chairman who shall be the Director of the Office of Technological Mobilization. The four directors shall be compensated at the rate of $10,000 per annum. The Chairman shall serve without compensation other than his compensation as Director of the Office of Technological Mobilization. The four directors shall be full-time employees of the Corporation and shall be in the employment of no other corporation or organization while they shall remain in the employment of the Corporation.

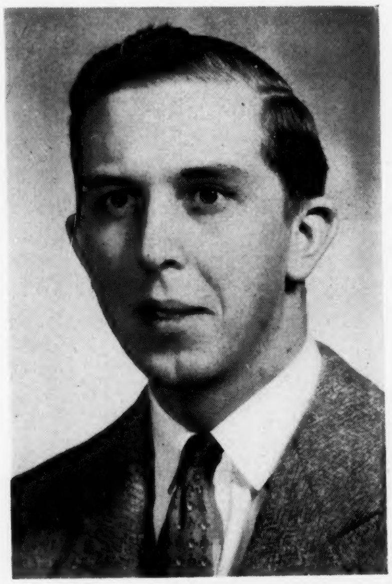
(e) All moneys of the Corporation not otherwise employed may be deposited with the Treasurer of the United States subject to check by authority of the Corporation, or in any Federal Reserve bank. The Federal Reserve banks are authorized and directed to act as depositaries, custodians, and fiscal agents for the Corporation in the general performance of its powers conferred by this Act. All insured banks, when designated by the Secretary of the Treasury shall act as depositaries, custodians, and financial agents for the Corporation.

(f) The Corporation is empowered (1) to make loans, grants, or advances to private persons, firms, corporations, or associations on such terms and conditions and with such maturities and conditions as it may determine, to enable the construction and development of research laboratories, semi-work plants, and pilot plants, or the conversion or expansion of such laboratories, semiwork plants or pilot plants, and to finance the acquisition of equipment, facilities, machinery, supplies, or materials; and such loans, grants, or advances may be made or effected either directly or in co-operation with banks or other leading institutions through agreements to participate or by the purchase of participations, or otherwise; (2) to purchase or lease such real

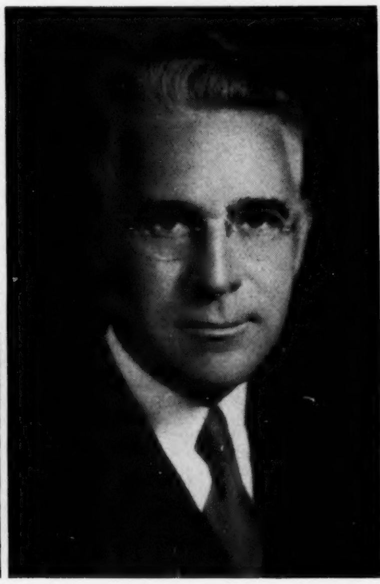
(*Continued on page 908*)

Headliners in the News

Scene at the left is at the Adventurers Club, Chicago, on the occasion of a testimonial dinner given by the Chicago Chapter of the American Institute of Chemists to Professor Vladimir N. Ipatieff, world-renowned chemist and his wife in commemoration of his 75th birthday anniversary. The dinner also marked the golden jubilee of the Professor's career in chemistry as well as the couple's golden wedding anniversary. Professor Ipatieff and his wife are shown in the picture below. At the top, from left to right are: J. G. Alther, vice-president of Universal Oil Products Co.; H. J. Halle, president of Universal Oil Products Co.; Dr. Gustav Egloff, director of research, Universal Oil Products Co.; Dr. Frank C. Whitmore, dean of Pennsylvania State College; Dr. Vandeveer Voorhees, Standard Oil Co. of Indiana, chairman of meeting; Professor Ipatieff; Mrs. Ipatieff; Dr. Ward V. Evans, professor of chemistry, Northwestern University.



Below, left, Dr. Roy A. Shive, of the Calco Division, American Cyanamid, who has been called to Washington by the Rubber Reserve Co. to supervise production and development of chemicals for the program. Below, center, J. L. Bennett, manager of chemical operations, explosives department, Hercules Powder Co., who was elected president of the American Institute of Chemical Engineers at the 35th annual meeting. Below, corner, Mrs. Irene Moore has become the first woman faculty member of the Pratt Institute (Brooklyn, N. Y.) School of Science and Technology. Right, Loren Dickerson, a member of the staff of Arthur D. Little, Inc., Cambridge, Mass., was one of 28 new members recently elected to membership in the 200 Associates of Phi Beta Kappa. He was the only industrial chemist of the group.



Chemical Engineers Set Record Attendance at 35th Annual Meeting

With a streamlined meeting of but two days and all social functions eliminated the American Institute of Chemical Engineers set a new record at Cincinnati with over 450 in attendance. Among the highlights of the meeting were sessions on "Operating Kinks for War Time Production" and "Plant Protection in War Time."

Left to right, Dr. Raymond L. Cooper, Principal Chemical Engineer, T V A, Wilson Dam, Ala.; J. L. Bennett of Hercules and newly elected President of the Institute; Dr. Barnett F. Dodge, Professor of Chemical Engineering at Yale; and Dr. Albert B. Newman, Dean of Engineering, C. C. N. Y., and Regional Adviser for U. S. Office of Education on E S M W T Program. These four temporary bachelors had a table together on H. M. S. *Samaria* in 1936 on the way to London to attend the Chemical Engineering Congress of the World Power Conference.

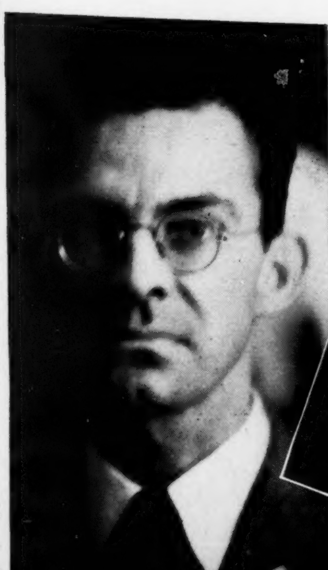
Left, Dr. Harvey N. Davis, President of Stevens and now in Washington working on the technological manpower problem, and Sidney D. Kirkpatrick, Editor of "Chem. and Met." and retiring President of the Institute. Dr. Davis was the principal banquet speaker.

Above, Leo E. Ryan of Monsanto, Canada, and Francis J. Curtis, Assistant Director of Development of Monsanto Chemical.

Left, Dr. George Granger Brown, Professor of Chemical Engineering at Michigan and newly elected Vice-President of the Institute.

Below, Dr. G. A. Jorquera of Chile, and Procter Thompson, General Chairman of the Meeting, and Associate Director, Chemical Division, Procter & Gamble Co

Left, R. P. Kite, Development Department, The Dorr Co., Delbert E. Jack, General Sales Manager, Duriron Co. Right, John T. Cox and Karl Kammermeyer, now with Publicker and formerly Associate Assistant Professor of Chemical Engineering at Drexel.



CAUSTIC SODA

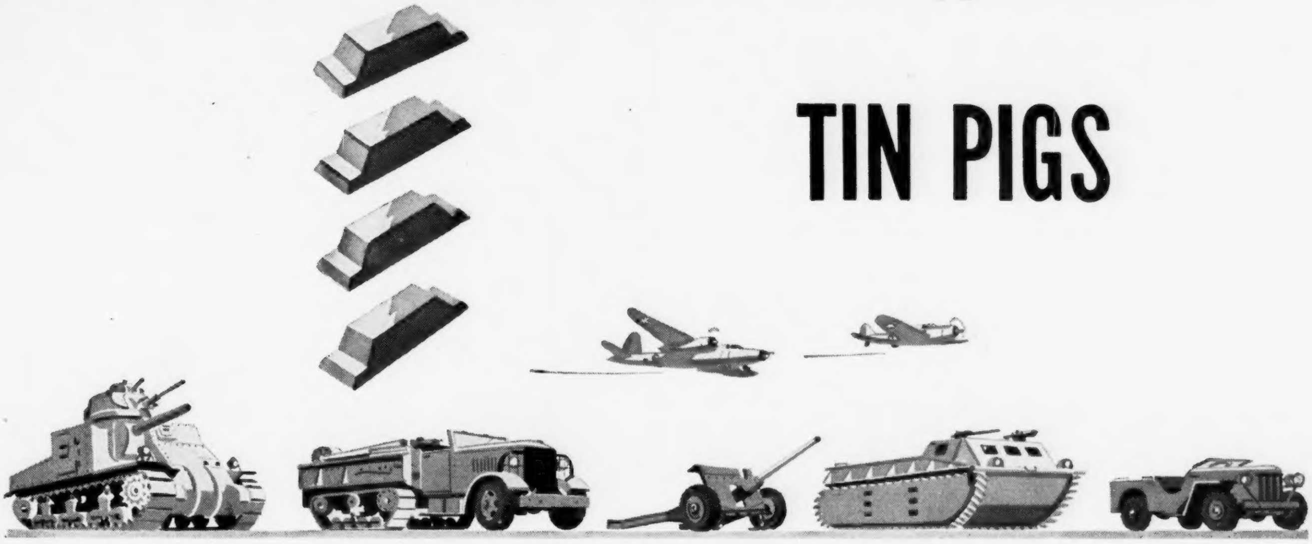
THE UNIVERSALLY USEFUL CHEMICAL

FROM

TIN CANS

TO

TIN PIGS



RENEWED INTEREST in the detinning of used cans is due directly to the war. Heretofore, the operation was considered impractical. With metal sources restricted, it now becomes an industry of vital importance.

Caustic Soda is an indispensable chemical for the removal of the critical tin from sheet steel. This universally useful chemical, in solution, dissolves the vital tin from the base metal.

Tin oxide, which is precipitated during the process, is dried and reduced and then cast into tin pigs which are sent to vital war industries using this metal.

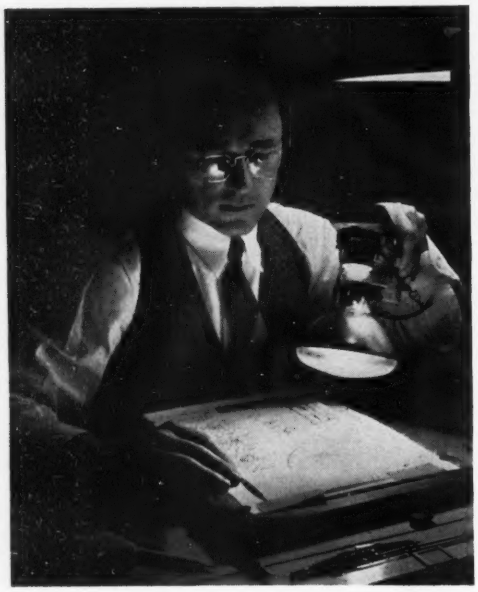
Dow Caustic Soda is being supplied to this industry—and more than 35 others—from strategically located shipping points. Uniformity and consistently high quality, plus short freight hauls, make Dow a preferred source. Inquiries are invited.

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York City • St. Louis • Chicago • San Francisco • Los Angeles • Seattle • Houston

Shots of Interest from Here and There



This Westinghouse draftsman is speeding up his work with a 250-watt R-40 bulb reflector drying lamp. After tracing his drawing with ink he turns this infra-red lamp on the drawing for about a minute and all the moisture disappears from paper and ink so that pencil marks may be erased and lines remain sharp. Process eliminates second tracing and speeds up drawing 10%.

Below, first commercial production of synthetic rubber from soy bean oil is announced by Reichhold Chemicals, Inc., synthetic resin manufacturers. Pictured are Henry Reichhold and Clinton Braidwood. Production of 2,000 tons a month is planned for 1943. Company calls it Agripol.
Lower corner, first tire made of reclaimed rubber as it came off the line at B. F. Goodrich. This is the type motorists eligible will get.
Right, Army-Navy "E" with two stars was awarded to the Huntington Plant of International Nickel Co. last month.

NEUTRAL ALKYL PHOSPHATES

A Group of Organic Phosphorus Compounds That Offer Interesting Possibilities for Further Chemical Research

The *organic phosphorus compounds* are much less familiar in the industrial field than the *inorganic phosphorus compounds*. The last few years, however, have witnessed a marked increase in research on the former . . . on the alkyl esters of phosphoric acid in particular. The result has been that many interesting applications have already been suggested. Among them are the following:

Plasticizer in cellulose acetate, in organic acid derivatives of cellulose, and in synthetic resins of the phenol-aldehyde type.

Waterproofing textiles with cellulose acetate.

Accelerators for curing urea-formaldehyde resins.

Polymerizing agents for unsaturated hydrocarbons, drying oils, resins, etc.

Catalysts for the dehydration of glycols and olefinic alcohols to diolefins such as butadiene.

Absorbing fluids in refrigeration systems.

Leveling liquids in printing compositions for vat dyestuffs.

Corrosion inhibitors for gun barrels, bearings of meters and compressors, etc.

Properties of the Neutral Alkyl Phosphates . . . the subject of exhaustive study in the Victor Research Laboratories . . . are summarized in the table below. From the latter it is apparent that a combination of the proper alkyl and phosphate groups will produce compounds which possess, within indicated limits, properties to meet widely varying requirements. Some of these compounds are already in commercial production; others are available only in laboratory quantities. Additional information, as well as samples intended for further research, will gladly be sent upon request.

PROPERTIES OF NEUTRAL ALKYL PHOSPHATES

COMPOUND	Mol. Wt.	Sp. Gr. at x°/4° C.	B.P. °C.	Ref. Index ND	SOLUBILITY						
					Water	Alcohol	Acetone	Ether	Toluene	CC14	Naphtha
Orthophosphates, R_3PO_4											
Trimethyl phosphate	140	1.2052(25)	196	1.3950							
Triethyl phosphate	182	1.0637(25)	215	1.4039							
Tri n-propyl phosphate	224	1.0023(25)	252	1.4136							
Tri n-butyl phosphate	266	0.9727(25)	289	1.4203							
Tri i-butyl phosphate	266	0.9617(25)	264	1.4173							
Tri n-amyl phosphate	308	0.9497(25)	225(50mm)	1.4283							
Trimethallyl phosphate	263	0.988 (26)	135 (5mm)	1.445							
Trioctyl phosphate	434	0.921 (25)	210 (8mm)	1.442	I	S	S	S	S	S	S
Tricapryl phosphate	434	0.907 (25)	Decomp.	1.437	I	S	S	S	S	S	S
Pyrophosphates, $R_4P_2O_7$											
Tetramethyl pyrophosphate	234	1.357 (25)	Decomp.	1.410	SR	SR	S	SS	PS	I	I
Tetraethyl pyrophosphate	290	1.200 (25)	Decomp.	1.417	SR	SR	S	S	S	S	I
Tetrabutyl pyrophosphate	402	1.050 (25)	Decomp.	1.429	R	SR	S	S	S	S	S
Tetraoctyl pyrophosphate	626	0.977 (25)	Decomp.	1.443	R	SR	S	S	S	S	S
Tripolyphosphates, $R_5P_3O_{10}$											
Pentamethyl tripolyphosphate	328	1.430 (25)	Decomp.	1.420	SR	SR	S	I	I	I	I
Pentaethyl tripolyphosphate	398	1.245 (25)	Decomp.	1.424	SR	SR	S	I	SS	SS	I
Pentabutyl tripolyphosphate	538	1.095 (25)	Decomp.	1.435	I	SR	S	S	S	S	S
Tetrapolyphosphates, $R_6P_4O_{13}$											
Hexamethyl tetrapolyphosphate	422	1.474 (25)	Decomp.	1.423	SR	SR	S	I	SS	I	I
Hexaethyl tetrapolyphosphate	506	1.280 (25)	Decomp.	1.425	SR	SR	S	SS	S	S	I
Hexabutyl tetrapolyphosphate	674	1.119 (25)	Decomp.	1.435	R	SR	S	S	S	S	S
Hexaoctyl tetrapolyphosphate	1010	1.053 (25)	Decomp.	1.447	R	SR	S	S	S	S	S
Metaphosphates, RPO_3											
Methyl metaphosphate	94	1.620 (25)	Decomp.	1.439	SR	SR	S	I	I	I	I
Ethyl metaphosphate	108	1.420 (25)	Decomp.	1.438	SR	SR	S	I	SS	SS	I
Butyl metaphosphate (unstable)	136	1.227 (25)	Decomp.	1.445	SR	SR	S	S	S	S	I
Octyl metaphosphate (unstable)	192	1.151 (25)	Decomp.	1.450	SR	SR	S	S	S	S	S

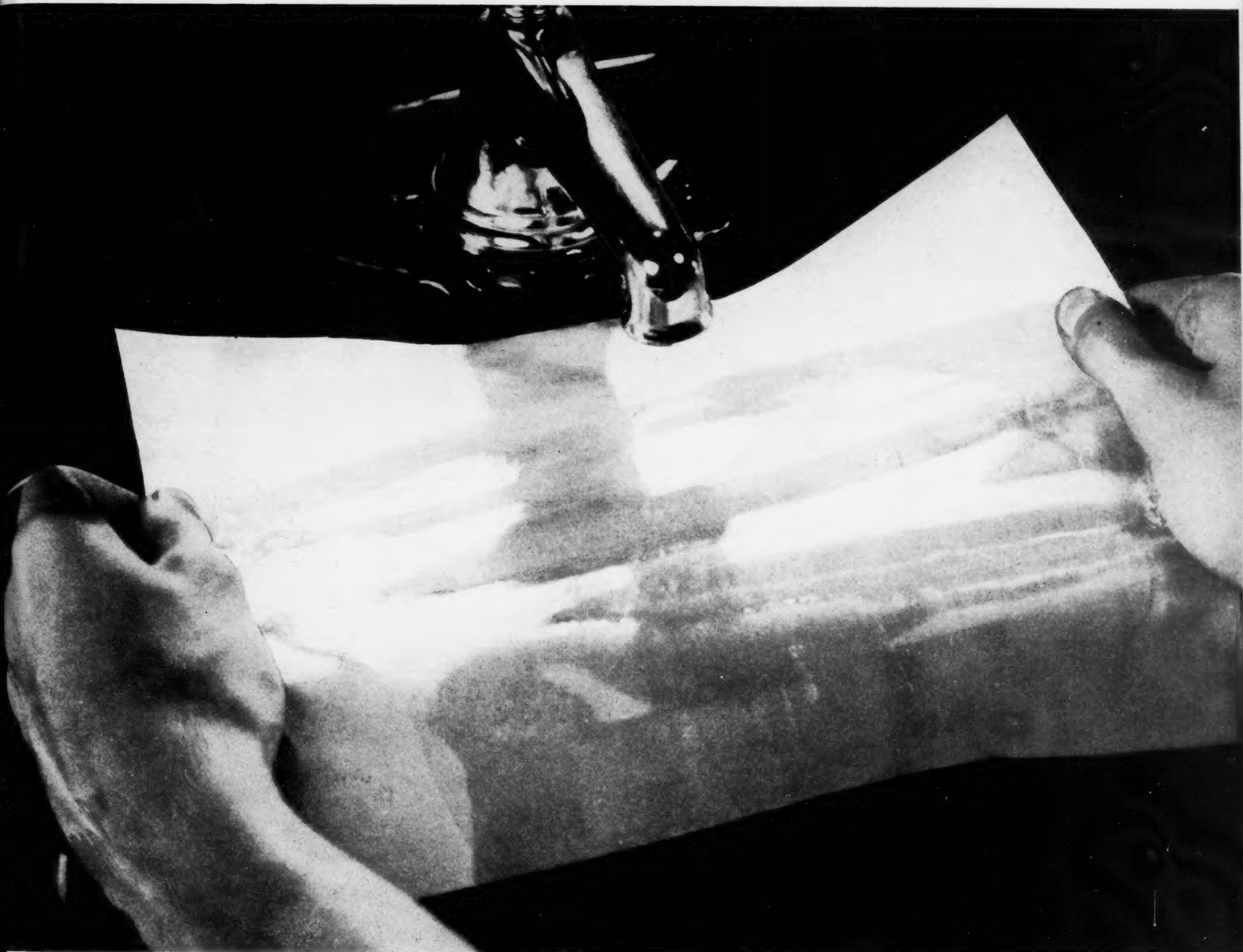
Key to Symbols

S = Soluble
PS = Partially soluble
SS = sparingly soluble
I = Insoluble
R = Reacts
SR = Soluble and reacts

VICTOR *Chemical Works*

HEADQUARTERS FOR PHOSPHATES • FORMATES • OXALATES

141 W. JACKSON BLVD., CHICAGO, ILL., NEW YORK, N. Y., KANSAS CITY, MO., ST. LOUIS, MO., NASHVILLE, TENN., GREENSBORO, N. C. PLANTS: NASHVILLE, TENN., MT. PLEASANT, TENN., CHICAGO HEIGHTS, ILL



NEW CHEMICALS FOR INDUSTRY

Aqualized paper, a product of the Brown Co., is finding use as a substitute for cloth and burlap. A new process gives the sheet an inherent wet strength all the way through, independent of any coating or sizing.

Digest of Chemical Developments in Converting and Processing Fields

Chemurgists Discuss Domestic Sources of Raw Materials

Third Mid-American Chemurgic Conference of Agriculture, Industry and Science, held in Cincinnati, Ohio, November 17-18, provided the sounding board for a new note in "Chemurgy"—Production of raw materials we no longer can secure from abroad.

Tanning Materials and Their Chemurgic Interest

By R. M. Lollar and Fred O'Flaherty, ***University of Cincinnati***

LEATHER is said to be the seventh most important commodity for our army. We need only consider the variety of uses made of leather by a modern army to realize how true this is. It is thus vital that we keep the supply of leather adequate. This is possible only if we can secure the raw materials of leather, and of these none are more critical today than the tanning agents.

Those not in the leather industry may not generally realize it, but there are two distinct types of leathers. In general, leathers of the lighter weights such as we see in our shoe uppers are tanned with a mineral tannage secured by the use of solutions of inorganic salts such as those of chromium, iron, or aluminum. On the other hand, the heavier weights of leather such as we see in our shoe soles are usually vegetable tanned. Today, we are in a fairly comfortable situation with respect to mineral tannages; however, we are not so fortunate with respect to vegetable tannage. This situation can be alleviated, however, and this is a subject of direct interest to those who would develop chemurgy.

Before going further, let us consider the economic significance of the heavy leather industry in our country. It is difficult or impossible to estimate accurately how much vegetable leather is being made in our country in these war times. But, we can get an estimate of the size of the industry if we remember that in the relatively poor year of 1933 we produced 320 million pounds of vegetable tanned leather. To make this leather it has been estimated that we use a yearly average of 115,000 tons of 100 per cent tannin. This means that we are using about half a million tons of tanning-bearing materials since 25 per cent tannin is a good average for the natural sources of tannin. Truly, this represents an industry worthy of consideration.

To appreciate the importance of the development of domestic sources of tannin, we must have a little knowledge of vegetable tannins.

Tannins are amorphous, bitter substances found widely distributed in plants chiefly valuable, because among their many chemical characteristics they can convert putrescible skins and hides into the durable useful product we know as leather. But, tannins vary in their utility. There are two great classes of tannins, the condensed and the hydrolyzable tannins. The characteristics of a given tannin are still further controlled by the non-tannins associated with it, because though they do not tan, non-tannins do exert a profound influence upon tanning, and upon the resultant leather. Thus, a tanner does not use only a single tannin, but blends tanning materials to secure the desired end.

The world has been scoured to furnish

Governor Bricker of Ohio was a speaker.

the tannins which we were using a few years ago. Sicilian sumac, valonia or the acorns of certain oaks of Asia Minor, mangrove and myrobalans of the far east and gall nuts of China or the Mediterranean area remind us all too readily of global war. Even quebracho, which represents a very high percentage of our vegetable tannins, must be brought in from the Argentine on scarce ship bottoms. All in all, we were in 1939 importing about two-thirds of our vegetable tannins. Thus, it is easy to see how critical vegetable tannins are today.

Even our domestic picture is not too favorable. We have expanded and are expanding our domestic tanning industry, but there are a number of severe handicaps. Not the least of these is our general lack of knowledge of what sources of vegetable tannins are available domestically. This situation is being rectified by an effort to evaluate all possible sources. Another big handicap in the expansion of our domestic industry is the fact that chestnut, which has been our biggest source of domestic tannin seems to be one of the too numerous vanishing American species. During the last 40 years our native chestnuts have fallen victim to an unconquered blight, so that we are mainly using blight-killed remains as our tannin source. There is some possibility that blight resistant species may be introduced but even this will require a considerable amount of study before it can be successful. If then we are to meet the challenge new sources of vegetable tannins must be developed, and chemurgy, in its broadest sense, is the answer.

The first thought would be that we should be able to develop natural tannins from our native plant species. Dr. Alfred Russell, of the University of North Carolina, is now studying the flora of the southern section of our country with this aim, and has published a preliminary report (4), showing some promising results. Governmental agencies are also studying the problem, and the activities of the Department of Agriculture are encouraging. In this connection, the excellent outline by Frey and Sievers (3) should be studied. As you know, regional laboratories have been established to encourage chemurgic developments, and at the Eastern Regional Laboratory at Philadelphia, an extensive study of domestic tannins is being made. The Tanners' Council laboratory has studied certain of these possibilities and made analyses and offered assistance wherever possible.

Sumac has been a prized tannin because, among other things, of its desirable color. This has all been imported from Sicily, and, of course, is now unavailable. We have domestic sumac, but it has not found favor. There is no reason why we couldn't develop domestic sumac. Our middle Appalachian states now contain much wild sumac and cultivation is also suggested. It is probable that by proper practices in leaf picking and curing, we could develop a domestic sumac comparable to the Sicilian variety. This would open a new industry to utilize mountainous areas not now very profitable, from an agricultural viewpoint. Both Russell (4) and Frey and Sievers (3) stress this possibility.

In our southwest, a dock-like plant, known as canaigra, grows wild. Its roots represent a very promising tannin source. This product had a brief, meteoric rise forty years ago, but has been unused since then. This has been the subject of much study recently (3). At the Tanners' Council Laboratory we have studied canaigre and find it quite promising. Its development, not only of the wild roots, but as a cultivated crop, should be a possibility.

One intriguing possibility concerns the possible use of guayule as a tannin source. You are all aware of the publicity which this southwestern species has received in the current rubber shortage. It is quite probable that it will yield tannin, in addition to rubber latex. If so, it would thus be possible to work out a very economical utilization of this shrub.

One salient fact in our domestic tannin program is our failure to date to develop any cultivated sources. However, in the remainder of the world much progress has been made—Sicilian sumac, far-eastern gambier and many tannins of the British Empire are cultivated. Recently there has been a considerable expansion of the advertising of South African Wattle in this country. This seems to be a very desirable condensed tannin. Now, there is no reason why we could not develop a native wattle industry. One species is native to California and other species have grown in our southern states. There are also a great many species of the genus Caesalpinia which could be developed to supply a domestic source of our decreasing supply of hydrolyzable tannins. These species include tara, algarobilla, divi-divi, and cascalote, all of which have found some slight use when imported from Pan-American sources.

These specific examples by no means mention all of the possibilities. There is a need for a long range study of the entire field of domestic tannins. From a chemurgic viewpoint this study should be quite fruitful.

So far, we have mentioned only those species which require several years for maturity. From a production viewpoint, if an annual plant with heavy growth characteristics could be found with a high content of a desirable tannin, an entirely new field would be opened. Of interest is the report that lespedeza (1) contains tannin. Now, this report was concerned with the means of securing low tannin content, for palatability as hay. But, would it be impossible by plant feeding to develop a high tannin bearing annual?

Fred O'Flaherty, University of Cincinnati

One source of natural vegetable tannins which is poorly utilized in our country today consists of the bark of the trees of the lumber industry, particularly that on the West Coast. Use of this source is hampered by the foresting methods and the remoteness of the region from the heavy eastern concentration of the tanning industry. However, many investigators are studying the problems as is shown by the reports of Smoot and Frey (5) on western hemlock and Frey and Clarke (2) on Sitke spruce bark.

So far we have considered only the utilization of the naturally occurring vegetable tannins. Another very interesting chemurgic possibility is the development of tannins from our agricultural wastes. By this, I do not mean the extraction of an existing tannin. Rather, I refer to the conversion of the waste or some portion thereof into a substance capable of making leather.

We have in this country developed and used synthetic tanning materials. However, contrary to the European trend, we have not used these as true, complete tannins, but only as tannings aids or assistants. These synthetic agents are customarily obtained from industrial wastes such as the phenols or naphthalene wastes. There is every reason to believe, however, that many other wastes could be similarly used to advantage.

One waste now thus utilized is the waste sulfite liquor of the paper pulp industry. This liquor contains solubilized lignin, the non-cellulosic part of wood.

This solubilized lignin is converted to a tannin now finding some use in this country.

Lignin is also a waste in such materials as straw or corn stocks. So, here is a possible use of a farm waste, since we could convert this lignin into tannin. Furthermore, we need not restrict our efforts to the utilization of waste lignin. Any plant constituent might be made a raw material for a manufactured tannin. A research program designed to produce a truly comparable manufactured tannin from a feasible plant raw material would be a very valuable chemurgic project.

The entire field of securing domestic sources of tannin is open for a comprehensive research program. The need, the challenge, is there. We can find the answer in the form of an integrated program for the development of domestic sources of our tannins.

1. Clarke, I. D., Frey, R. W., and Hyland, H. L., J. Agr. Res., *58*, No. 2, 131 (1939) abs.; J. A. L. C. A. *36*, 212 (194).
2. Frey, R. W., and Clark, I. D., J. A. L. C. A. *36*, 576 (1941).
3. Frey, R. W., and Sievers, A. F., J. A. L. C. A. *35*, 647 (1940).
4. Russell, Alfred, J. A. L. C. A. *37*, 340 (1942).
5. Smoot, C. C., and Frey, R. W., J. A. L. C. A. *34*, 659 (1939).

Products from Casein

By F. C. Atwood, *Aralac, Inc.*

AT no time in American history has the development of new products been so important as today. Where in the past, research for the development of new products was for the purpose of finding profitable uses for surpluses, or creating or expanding business enterprises, or to produce something better, or something cheaper—today we are engaged in new product research to win the war and to preserve our way of life.

The developments of our science and industry as the result of the crisis we are passing through is going to leave a tremendous impact on our future. When the war is over and the seas again are opened to unrestricted commerce and nations are free to buy the goods they want to buy—we are going to find, I believe, that many of the things we previously thought so essential no longer are necessary, nor desirable. New developments will have made our past living outmoded and outdated. Pre-war luxuries will be after-war surpluses.

In this conference you will have heard many times about these newer synthetic products. I should like for a moment to pause and have you think of the chemists, the engineers, the artisans and administrators who make these things possible. You expect men to create these miracles. Yet these men are stimulated only by their imagination, by their creative urge and by their patriotism. It is hard for them not to join the physical fight where at least, they can let their emotions go into the battle. They dislike having their employers ask for occupational exemption. Yet these are everyday Americans who never fight in a battle, never get in the headlines, never win a medal but who go about their work with what Theodore Roosevelt called "the courage of the commonplace the most wonderful courage in all the world." They are civilian America at work applying themselves with never a let-up for long hours and long days.

And right along this same line there were some technically minded men who started the rubber program you all know by heart. Now, they did get it started. I am glad your Council executives did not make their task harder by joining in the political clamour for alcohol last summer. Much of the alcohol was in the program before the political explosion. If the alcohol program is sound, it will prove itself in time to enter into our chemurgic picture when we need it most after the war. If it is not sound, then a better outlet for our agricultural surpluses should and will be found. After all, and in spite of our desires, if we can recover only 25% or less of a potential yield by certain chemical processes we are better advised to use chemical brains and not political pressure to find some way of increasing this yield. And I believe further that as chemurgists we should still stick to our creed of putting chemistry and not politics to work for agriculture.

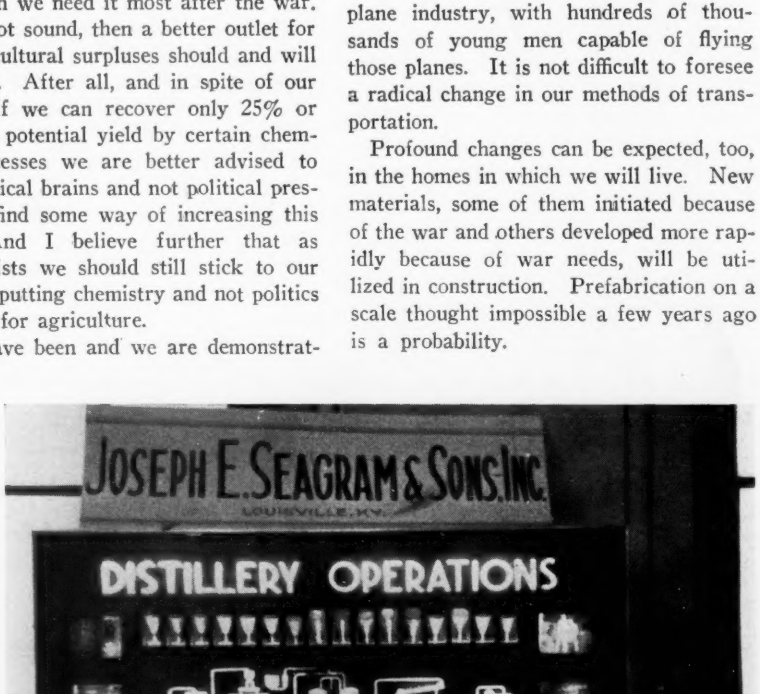
We have been and we are demonstrating that we can conceive, we can create, we can produce new products and new wealth from agriculture. Such a productive system is sound and permanent. It continually recreates itself several fold and any opposition gradually is smothered under sound realities and true values. Chemistry and not politics will ultimately lead us to a sound economy. Chemists know that the laws of Nature work for us only when we thoroughly understand and obey them. We cannot avoid by legislative fiat the sweat and tears we must give to acquire our knowledge.

Now that we are down to work I am sure that chemurgy now and for years to come will provide many rubber-like products. We will develop them to a point superior to natural rubber—over whose quality and uniformity we never have had much control. So much for rubber. The same effort will produce similar results in many other fields.

Because of the need for profitably using every inch of shipping space we are dehydrating many foods that were not thought of in that connection a short time ago. Millions of pounds of dehydrated foods—foods with only the water squeezed out and all the nutrients retained—will be produced this year. What effect that will have on the future distribution of foods after the war I cannot forecast, but there can be no question that it will have considerable influence.

We will have after this war a huge airplane industry, with hundreds of thousands of young men capable of flying those planes. It is not difficult to foresee a radical change in our methods of transportation.

Profound changes can be expected, too, in the homes in which we will live. New materials, some of them initiated because of the war and others developed more rapidly because of war needs, will be utilized in construction. Prefabrication on a scale thought impossible a few years ago is a probability.



One of the exhibits.

Camouflage paint requirements have finally turned the thoughts of the paint industry permanently toward casein and water thinned emulsion paints. Oil paint smells in homes and many other places may not be remembered after the war.

There are going to be changes, too, in clothing. Perhaps "changes" isn't the right word, because they will be only improvements on what we are getting accustomed to now. And that brings me to the principal reason why I am here—to tell you about "Aralac."

When I last was privileged to talk before this group, I had something to say about "Aralac," which as you know, is the fibre National Dairy Products Corporation, through its Aralac, Inc., division is making out of milk casein. At that time, because some of the answers we were seeking had not been found, I could not tell you as much about "Aralac" as I would have liked. And now, when I am in a position to tell you about it, it is possible you already know it—because "Aralac" has had such success that its fame has spread all over the country. You have read about it in the fashion magazines. You have seen it in the news reels. And you will find it in many stores.

If I do nothing else, I do want to make one thing clear—"Aralac" is not a wool substitute. It is not a substitute for any fibre. This is not to deride substitutes, because the exigencies of war have caused us to develop many substitutes. It so happens, however, that "Aralac" is able to stand on its own merits and if we thought for one moment that it was only a "war baby" we would turn our energies to something else. Many of you may be familiar with the troubles and problems occasioned in the years when rayon was called artificial silk. Certainly, we of "Aralac" have no desire to repeat that episode by characterizing a new protein-base fibre as a wool substitute.

These times challenge our imagination and demand the utmost in vision. There is no time left for dreams. I have never forgotten the picture presented to us as undergraduates by Dr. Willis Whitney that "old men dream dreams, but young men see visions." The present time calls for very practical and daring vision with immediate translation of the vision into developments, of developments into unit production, and of unit production into mass production. The time between these several stages must now be very short. I consider it fortunate that so far as one phase of Aralac is concerned, we have this period of our vision, development, and unit production behind us, extremely necessary though they were. We have reached the end of our beginning. We are now in mass production and that production is rapidly leaving the retail shelves and going into your homes.

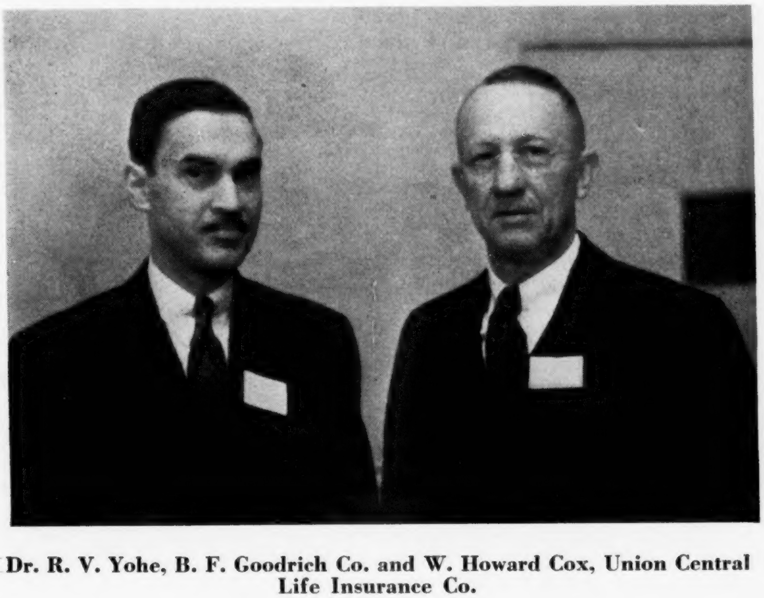
We want no one to have preconceived ideas of what this new material may do simply because of a vague idea of the properties of one of the raw materials which goes into its make-up. You never know whether you are going to get certain vegetable oils in soap or in salads, in textile lubricating oils or in mayonnaise. You could not tell from your knowledge of carbolic acid whether it is going to be an antiseptic for dressing a wound, whether it is going to be a beautiful piece of plastic, or whether it is going to be modified into nylon. There is no reason to judge, therefore, from any present knowledge you may have of proteinaceous materials what that protein is going to act like when it has been modified into a fibre, because you may have, at some time, drunk some of it as milk, eaten some of it as cheese, or worn it for a great many years as buttons on your coat.

You may know that cheese sometimes gets objectionable, but I never heard anyone complain about the buttons of their coat for that reason. We have been asked several times by consumers whether Aralac blended fabrics, being made from milk, will turn sour and become odorous. We have told them that since infinite care and chemical ingenuity are used in the manufacture of this new protein-base fibre, they should be able to free their minds of any idea except that the fibre will gracefully take and keep its place in polite society. They can forget that the early attempts at such fibres made by the Italians and the Japanese were as unstable as some of their political philosophies. We expect and feel that Aralac will justify the position awarded it as a product of American free enterprise and that further American free enterprise will be ingenious enough to present it to the American public as raiment of true textile ingenuity.

Give Complete Data

Sometimes even our friends will present Aralac in terms partly true and partly false. So far as we can, we will quickly correct any such statements; but where the statement may be true but incomplete, we will attempt to fill in the details. It is our job as raw material suppliers to furnish the public with all possible technical facts concerning the products we supply uncolored in any way and free from incomplete and inconclusive data.

Let me refer, along this line, to a statement recently made that is slightly misleading. The statement is made that casein "is a chemical building block for a cheap serviceable fibre." A further statement is made which may possibly be true but which is certainly incomplete and misleading in its hopes. The statement is, "(This fibre) can be made on existing rayon machines with but slight adjustment." It is inconceivable that a casein filament might be spun on existing rayon machines considering solely the extrusion of a viscous liquid through a spinnerette into an acid coagulating bath and adjusting for the slow coagulating rate for such a solution as compared with the viscous cellulosic dispersion. The analogy would stop there, however, because whereas the cellulose would be converted into a fibre subject only to simple washing and surface treating processes, yet the casein regenerated as a filament is still very young in its life as a fibre and must be still further chemically modified, restricted, and molecularly treated before it can serve any useful purpose as a textile fibre. While I know little about rayon manufacture, I feel quite sure that one of the reasons the Italian and Japanese protein-base fibres have not yet progressed very far, so far as we know, is because they did adopt rayon technique, because their fibres were



Dr. R. V. Yohe, B. F. Goodrich Co. and W. Howard Cox, Union Central Life Insurance Co.

developed along rayon lines and because they were not treated as separate and distinct entities apart from cellulosic fibres. I have no illusions that any processes or techniques we have developed in the manufacture of Aralac would be useful in the manufacture of rayon, and without rather convincing evidence I believe I should dispel the illusion that Aralac or anything like it could be successful or economically made in existing rayon plants.

There is one other vision for which I am partly responsible and for which I should now furnish a few restrictive outlines; namely, that each year there are over a billion pounds of milk casein waiting to be used in the textile industry. It is true that such an amount of casein does exist each year and is used for purposes which could easily be supplied by other products if a higher level of value were accorded the casein. Proteins generally are one of the most abundant of organic chemical compounds available in this country. Substantial contributions must still be made to the field of collecting and assembling these proteins in a form satisfactory for fibre making, and capable of reaching into the highways and byways where these supplies of protein exist. I doubt if such a job can be done on a self-sustaining basis. I feel it can be solved as our chemical problems have been solved.

Soya Protein

Some mention has been made of soya bean protein, but it still is very early to think of this even if it made an equally desirable fibre because even after more than ten years' work and after a tremendous capital outlay, the production of soya protein is still but 20,000 pounds per day and this is all in demand for other uses and is not comparable to the casein of fibre-making quality. Protein can be extracted from grass and many other agricultural products, but so far it has been vastly more economical to let the cow eat the grass, let her act as our initial processing factory, and recover the processed protein from the milk.

Assuming we have collected the raw material, the mechanism of our fibre production is as follows:

The casein arrives at our factory and after very careful blending is dispersed or dissolved in water with suitable solvents. The viscosity is adjusted to a uniform base. All adventitious materials or aggregates of any kind are removed and the product forced through spinnerettes into a coagulating bath. The wet tow from a number of spinnerettes is collected and put through a succession of treatments both wet and dry which transform the casein molecule into a new and resin-like compound of which casein is but a part. The type, number, and sequence of steps are varied and determined by the use to which the finished fibre is to be put. The final treatments are given the fibre only after it is determined for what industry the fibre is destined.

It is true that a great many types and varieties of fibre could be made, but present times demand simplification of grades, even if our own production problems did not demand such simplification. Aralac, therefore, is made with a fibre diameter distribution substantially equivalent to 50's, 60's and 70's wool or average 30, 25 and 20 micron diameter. For some uses, a straight uncrimped fibre is most desirable, whereas for textile purposes a natural, wool-like crimp seems most useful. For a totally different use a product called "Wavecrepe" was developed with a relatively fine and permanent crimp. It should be repeated that Aralac is offered and has been used by industry because of the qualities of the fibre itself and not because of any attempt nor desire to use it as a wool substitute.

At the risk of being accused of entering the realm of salesmanship and forgetting the role of the chemist, I want to discuss briefly some of the properties of "Aralac." It is warm; it absorbs moisture quickly like silk and wool; it lends crease and wrinkle-resistance to fabrics; it is soft, pliable and drapes well; it requires special care in dyeing, but properly handled produces effects of unusual beauty; it costs less than wool, but more than rayon or cotton.

Since it was introduced to the textile trade less than a year ago, it has grown in favor by leaps and bounds. From the very start, production has been maintained at plant capacity and a far greater amount could be sold if we had the facilities for making more.

We should continually repeat that we are not in competition with wool growers nor with manufacturers of rayon of any kind. It is desired only to produce a fibre of maximum utility and service to the textile world regardless of whether it would be as a servant of other fibres or whether we utilize some of the known attributes of present fibres to serve our purpose and to enhance the value of our product. In any case our technology is directed toward the production of a new fibre useful in the textile industry not because a new fibre or a substitute fibre is needed. Rather, Aralac has found what normally is the case, that, as a new chemical development, it finds a place of its own in the textile sun and will probably make more desirable fabrics available to more people than ever before As for the future, Aralac hopes to contribute to the expanded uses of the products of the fabric industry.

Aralac was developed primarily because the technology of all our associated companies is directed along chemurgic lines. Our parent company, National Dairy Products Corporation, as well as its associated companies have been successful, we think, because they have continuously and sincerely worked to distribute consumer dollars back to a large and important section of our population; namely, the dairy farmer. It is hard to conceive of any place where a few hundred dollars as cash income per year can serve so useful a purpose in our national economy during normal times as when it is distributed back to the proprietors of these farms. In return, it would equally be conceived that such a distribution will help to stabilize a new source of raw material for and will bring much of new value to the textile industry.

I am confident that as chemists we can plan and direct the development of this new fibre at an increasing rate of utility which will be highly satisfactory. I have no expectation other than that the collection of the raw material can be accomplished by those who have made a life study of the dairy farmer's problem and know how to gain his co-operation. Our background is such that we have no preconceived idea of what such a fibre should do or where it should go. We are trying sincerely to avoid any such freezing of ideas. What the fibre can do and what can be done with it is probably bounded only by the combined imagination of the textile designers and ourselves. Basically, it is subject to many possible modifications, any one of which may offer a new field of usefulness. This fact has already been proven several times the past few months.

The future for a protein-base fibre of this type will, therefore, be in large measure determined by what the textile people ask for. Substantially all our industrial uses of Aralac to date are the outgrowth of very close co-operation between the textile people as designers and ourselves as producers. There are already in the laboratory dozens of products each with a different appearance because of some slight modification in the process. It may take some time to equip ourselves for production in volume of any new product, but you and I both know that the earlier one starts on such developments the sooner such vision is likely to get into production.

In conclusion, I want to leave this thought: If, today, I undertook to forecast the chemurgic possibilities of milk, giving full play to fantasy, the chances are that ten years hence I would look back and chide myself for being a timid, unimaginative conservative. To a chemist, who despite many years' research in milk, is still only standing on the threshold, the potentialities of milk in industrial research are almost limitless. I can predict safely that before your next meeting you will have heard of some of these new products.

Essential Oils and Their Production In the Western Hemisphere

By Dr. Ernest Guenther, *Fritzsche Brothers, Inc.*

ESSENTIAL oils are composed of complicated mixtures of terpene derivatives which make plants, or parts of plants, aromatic. Essential oils are also called volatile oils because, unlike fatty oils (coconut, linseed, sesame, etc.), they evaporate at ordinary temperature. The pronounced proper odor of essential oils is probably a function of their rate of evaporation.

The designation "essential" very likely originates from the French term "essence" and is quite appropriate insofar as these oils are important constituents in many products of our daily lives. Each day we utilize a great variety of essential oils, for instance, in pharmaceutical preparations, food products, such as, meats, sausages, canned goods, bakery products, confectionery, furthermore in beverages, alcoholic and non-alcoholic, soaps, disinfectants, room sprays, cosmetic articles and perfumes. The figures of the essential oil trade itself may appear not very significant, but the fact remains that many industries depend upon essential oils for odor and flavor of their products, not to speak of the medicinally active principles. The soap and cosmetic industries alone show a yearly turnover of several billion dollars which figures, however, must be tremendously increased if we include the more vital pharmaceutical, food and beverage industries. Hundreds of thousands, if not millions, of people depend for their livelihood upon the manufacturing, advertising, wholesale and retail distributing of these products, most of them necessities, a few luxuries.

The production of essential oils must be carried out according to the condition in which the oil occurs in the plants. If the oil is contained ready-formed and in large amounts, it can be extracted by the simple method of pressing. A simple experiment illustrates this condition:

Take the peel of an orange or lemon and squeeze it against the light of a match. The fine spray of oil expressed from the peel is ignited by the flame and burns explosively, thus demonstrating the presence of such a large amount of oil that it can be liberated by simple pressure causing rupture of the cell walls. The process of extracting citrus oils (oranges, lemons, limes, grapefruit, mandarins and bergamot) is based upon this principle. In a primitive way the process is carried out by simple handpressing, while in technically advanced countries machines are employed.

In most instances, the essential oil occurs in the plants in such minute amounts that pressing gives no results. These oils are obtained by distillation. The plant material is charged into a still; water is added and brought to a boil. The steam breaks the walls of the oil containing cells, liberates the oil and carries it over as vapor into the condenser where steam and oil vapors are reliquefied by cooling and collected in a so-called Florentine flask. Not being miscible, the two layers of oil and water can be drawn off separately. Distillation is a simple and ancient method and today the bulk of essential oils is produced by distillation. In many instances, distillation is carried out in rather primitive migratory stills set up in remote growing regions. It is also undertaken in the large and modern factories of Europe and the United States which process plant material grown nearby or imported from abroad.

The entire production of essential oils can thus be classified according to two principles:

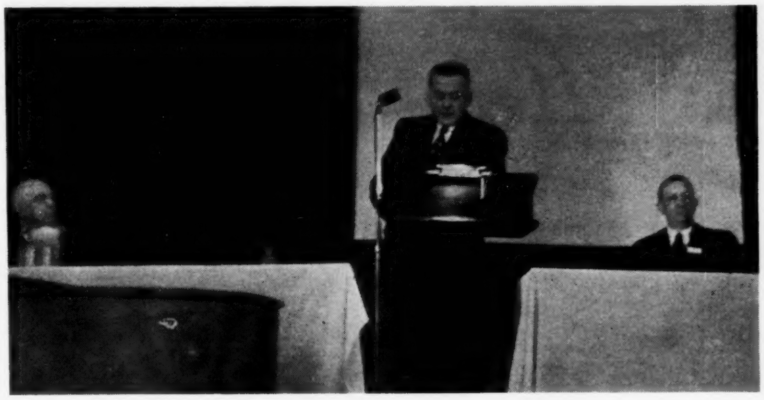
(1) In most instances the aromatic plants grow wild or are cultivated as garden crops by natives. Raising the plants and distilling the oil represents a primitive family industry based upon cheap labor, without cost calculation. The natives produce small quantities of oil according to primitive methods and sell it through a network of field brokers to village buyers until the oils finally reach the exporters in the shipping ports. The price of such oils depends upon the market which, in turn, is influenced by supply and demand. The natives are usually well aware of the prevailing quotations and prefer to stock up their output rather than sell it at unattractive prices. Modern methods of production can hardly compete with this primitive industry because it is hard to undersell the natives who never consider their own and their families' labor. An outstanding characteristic of native production is the fact that they usually produce only one or two oils.

(2) Advanced processing methods, based upon modern agriculture and engineering, try to compete with low priced labor by mass production. The oils obtained in these essential oil factories are of superior quality but the operating expenses are usually high; many factors, such as, a higher standard of living and wages, salaries of directors, taxes and general overhead expenses increase the cost of production. A modern factory, trying to specialize in the production of one yearly crop can hardly survive under these conditions; operation is profitable only if a variety of products can be processed, thus keeping the enterprise busy all year around.

Must Produce Several

Such an organization has to produce several oils, the plants of which are grown in the neighborhood. In other words, a factory of that type would have to be located in the center of large plantations connected with good roads, and would require almost ideal conditions of soil, climate and altitude, permitting the growth of many aromatic plants. Theoretically, this is the ideal solution for our industry but it involves heavy initial expenses.

Today, most essential oils are produced on the basis of a primitive family industry flourishing in many corners of far off countries and only in a few instances have we succeeded in placing production on a modern agricultural and technical basis. Oil of sweet orange offers probably the best example in this respect. Until about twenty years ago, the oil was produced exclusively in Sicily by countless small peasant growers who raised the fruit in their own orchards and extracted the oil by simple handpressing. About 1928, the highlands of French Guinea in West



Dr. Ernest Guenther, Fritzsche Bros.

Africa started to produce this oil even cheaper because hand labor in Africa was still lower priced than that of Sicily. A number of years ago, California and more recently Florida commenced to manufacture oil of orange and lemon according to modern methods of engineering. This was possible because California and Florida possess a network of good roads permitting transport of the fruit from widely scattered regions to centrally located processing plants. Today, the United States is independent in regard to oil of lemon and, to a certain extent in regard to oil of sweet orange.

The same development took place in regard to the production of oil of peppermint and oil of dill weed. Many years past, oil of peppermint was produced in Russia, England, Germany and Italy on a rather small basis but, for quite some time, the United States has been a very heavy producer of a high grade oil of peppermint which, before the present war, has even been exported to Europe. Oil of dill weed used to be produced in England, Germany and Hungary but, for the past few years, we have become independent of this oil which is so important in the flavoring of certain food products, such as pickles. This development was possible only because we employed modern methods of agriculture based upon the use of machines.

Other Oils, Too

In the course of years, a corresponding evolution will probably take place also with other oils which so far have been produced in far-off corners of more primitive countries. Here and there, even in remote regions, more advanced methods of production, especially of distillation, were introduced with a resulting steady improvement of the quality of the oils. A few months before the outbreak of the present war, the American essential oil industry had reached a high degree of perfection, even though many oils still came from distant countries where the old methods prevailed. We had succeeded in obtaining pure oils as they occur naturally in the plants, and secured sufficient data and standard samples by which to check incoming goods as to purity and quality. In Southern France, Fritzsche Brothers, Inc., operate their own factory extracting natural flower oils and distilling imported tropical plant material or spices.

The outbreak of the present world war abruptly changed the picture. The main producers of essential oils, such as Southern France, Italy, the entire Mediterranean basin, Yugoslavia, Bulgaria, Belgium, Holland and Tyrol no longer could supply the United States. The French colonies, after the collapse of France, were excluded by the British blockade. Still other countries, like Japan, with its very important camphor oil and menthol industries, joined the Axis. English controlled countries like Zanzibar, India and Ceylon, suffered from the lack of shipping space, a condition aggravated as the war went on. British Malaya and the Dutch East Indies, heavy producers of the most vital essential oils, fell under the blows of Japan and are no longer accessible to the Allies. This condition applies not only to essential oils but to spices and drug plants in general. In many ways, the essential oil, the spice and crude drug industries are intricately interwoven, many essential oils being extracted from imported spices, plants and drugs.

U. S. Cut Off

The picture, therefore, presents the United States today as being cut off from at least three fourths, if not more, of its former sources of supply. Only a few years ago, our pharmaceutical, food, beverage, soap, cosmetic and perfume industries had succeeded in emancipating themselves from the old sources of supply of finished goods in Europe. Not so long ago Europe was the main manufacturer of pharmaceuticals, drugs and cosmetics supplying the United States, as in colonial days. American ingenuity had succeeded in establishing in the United States corresponding new industries producing goods which not only equalled but even surpassed the best creations of Europe. American drugs, food products, canned goods, beverages, soaps and cosmetics, gained throughout the world a high reputation and replaced the old established European brands. With the outbreak of the war and the present partial isolation of the United States, our industries no longer are in a position to supply these products unless we succeed in establishing new sources of supply of the basic materials, especially essential oils, in the Western Hemisphere. Many attempts are being made to this effect, fostered by Government agencies, for instance, the Department of Agriculture, Pan American Union, the Coordinator of Inter-American Affairs, Agricultural Division, and others, not to mention a few private firms who possess the actual experience and knowledge of producing and handling these valuable ingredients. It is here that the National Farm Chemurgic Council is finding a new field of important industries. Yet, the task is difficult because essential oils form a highly specialized chapter, and few men have had the necessary practical training. Many factors have to be considered, such as proper climate, soil conditions, altitude, experience in planting, growing and distilling. Much of the planting material is, at present, unavailable. However, despite all these difficulties which sometimes seem insurmountable, a slow but steady progress is being made. After all, previous to the last world war the United States had no chemical industry to speak of, but during its course America created its own industry which today, is equal, if not superior, to anything Europe has to offer, particularly as far as mass production is concerned. It is quite possible, that the present emergency will force the Western Hemisphere into the establishing of its own essential oil, spice and crude drug production. Until a few years ago, this task would have been impossible because it was hopeless to compete with the low priced labor of Japan, China, India, Africa and the Dutch East Indies. With the present high market prices and the increasing scarcity of goods, the task seems easier. The major part of many of the oils will have to be produced in Central and South America because of the tropical climate required but there are others, especially those important for the flavoring of food, which can be produced in our country. This chapter is becoming increasingly urgent because our armed forces and our allies abroad depend upon us for supplying food which is palatable. No army can march without food and food must be palatable. This group of oils includes oil of celery seed, oil of parsley leaves, oil of dill weed, oil of fennel seed, oil of coriander seed, oil of anise seed, oil of caraway seed, oil of thyme, oil of sage, oil of marjoram, oil of savory and a few more. These plants can be raised in a temperate climate and there should be no insurmountable difficulties in regard to producing at reasonable and competitive prices, provided we employ machines. Most of these oils, so far, have been imported from Europe where they were produced in many scattered districts and usually on the basis of a family industry.

Want Assistance

Hardly a day passes when we do not receive letters from North, Central and South America requesting information and assistance in the task of growing aromatic plants and producing essential oils. Many of these new ventures will prove futile because of adverse natural conditions, but some will be and already are successful. The task will become easier as more experience is gathered and as the various Government agencies learn to cooperate and exchange their experiences. It would not be surprising if after the end of the present hostilities the Western Hemisphere should be independent at least in regard to the most vital essential oils, spices and crude drugs.

NEW PRODUCTS AND PROCESSES

By James M. Crowe

SYNTHETIC white sapphire, the mineral corundum unpigmented and of gem quality, is now available in the form of boules according to The Linde Air Products Company. The boules, the form in which the sapphire is manufactured, each weigh at least 150 carats and are of a regular cylindrical shape, enabling gem cutters to standardize on cutting and sawing procedures. The material, as now made, is practically perfect, any imperfections being microscopic in size and having no effect whatever on the quality of the material for precision bearing surfaces and other essential industrial parts.

Instigated by the need of a domestic source of industrial gems, the manufacturer in less than two years equalled and, in some respects, has surpassed the quality of European gems, formerly the only synthetics obtainable. Since domestic production started, it has grown so that it is now capable of handling the entire military demand for all the United Nations.

Mineralogically, the hardness of the American white sapphire is exceeded only by the diamond. Once they are cut, the jewels are also surprisingly tough in terms of resistance to breakage by impact. Moreover, because they have a melting point of over 3,700 deg. F., they are also heat resistant to a high degree. An additional advantage is the boules' uniformity of size and shape, which leads to economical cutting.

Many essential uses are already being made of jewels cut from these synthetic boules. Among locations where they serve economically are as the jewel bearings of chronometers, compasses, and electrical, fire-control, and aircraft instruments. In such instruments, they are employed in the form of ring bearings or V-type and cup-type end bearings. Pallets are also made for watch escapements.

Other successful although still experimental uses of the white sapphires are as thread guides in the manufacture of rayon, as orifices for flow meters and oil-burning equipment, and as insulators in gas-filled or vacuum thermionic devices. Indications are that they are also suitable for use as diesel-engine injector nozzles, as rollers for small needle bearings, and for cutting tool tips to perform high speed finishing operations on certain non-ferrous metals. Their chemical inactivity when exposed to all types of corrosion except strong mineral acids and alkalies may suggest additional uses to designers of chemical equipment.

Sorting Flake Mica

A new process for sorting small flake mica, an essential ingredient in much of the electrical equipment being manufactured for the Nation's armed forces, has been developed by Bureau of Mines engineers and is available to commercial producers of this widely-used material, according to Dr. R. R. Sayers, Director of the Bureau.

According to a report prepared by Oliver C. Ralston, principal chemical engineer, and Foster Fraas, assistant chemist, Bureau of Mines, the process known as "electrostatic grading" has produced test batches of closely-graded mica flakes which were used by a large manufacturer of electrical equipment.

The United States has unlimited reserves of mica suitable for grinding into powder, Dr. Sayers added, and the fine flakes of this mineral are mixed with various binders to produce materials of extreme durability, such as radio insulators and panels, plastics, moulded hard rubber, and special paints to withstand weathering. Prior to the development of the new method, powdered mica could be graded as to the area of its face surfaces, but not as to thinness of the flakes.

In their experiments, the Bureau engineers fed the closely sized powdered mica to a shaking table and subjected it to charges from a grid electrode above and parallel to the table. The thinnest flakes were buoyed most by electrostatic forces and thus were separated from the thicker flakes. Different thicknesses of mica were separated at different points along the shaking table. The "electrostatic grading" method was tested with other sorting methods and was found superior, the investigators asserted.

The report explained that in addition to improving the quality of the powdered mica now used, the "electrostatic process" can be employed in conserving quantities of the material which now are discarded as waste because of difficulties encountered in grading.

Synthetic Wax

In replacing rubber as a cloth backing in the manufacture of raincoats, life belts, etc., the plastic material polyvinyl butyral has been used with considerable success. However the characteristic surface tack of this material has to be eliminated without, of course, adversely affecting the other properties. According to Glyco Products Co., Inc., it has been found that Acrawax C, a synthetic wax, when added to the polyvinyl butyral in amounts as low as 1% effectively eliminates this surface tack. Furthermore Acrawax C is a high melting point wax (275-280° F.), non-brittle, water insoluble and non-greasy. One per cent is compatible with the plastic and shows no signs of blooming to the surface. It is available in powdered form and therefore can be readily incorporated with the other compounding ingredients in the milling operation.

Acrawax C is also being used as a waterproofing agent; in plastic molding powders; as a lubricant in the molding of sintered bearings; as a flexible insulating wax having a low dielectric; in the manufacture of polishes, etc.

Degreasing Solvent

A new cyclodiene hydrocarbon solvent for degreasing ferrous and non-ferrous metals and other materials has been announced by the Technical Processes Division of Colonial Alloys Company. In accordance with Bureau of Explosives standards this material is non-inflammable and non-explosive; it is claimed non-corrosive and rust inhibitive.

Work dipped into the solvent at room temperature is removed degreased and with a thin rust protecting film that evaporates after 20 minutes. To speed evaporation the work should be dipped once more into hot water or "Methanated Hydrocarbon."

Of special interest to finishers is its use as an alternate for vapor degreasing, chlorinated hydrocarbons, aqueous alkaline degreasers, benzenes, and similar types of cleaners. Re-distillation yields 90% recovery at 375° to 410° F.

It can be stored in standard degreasing machines and in open wood or steel tanks. At the present time priorities are not required and the supply is unrestricted.

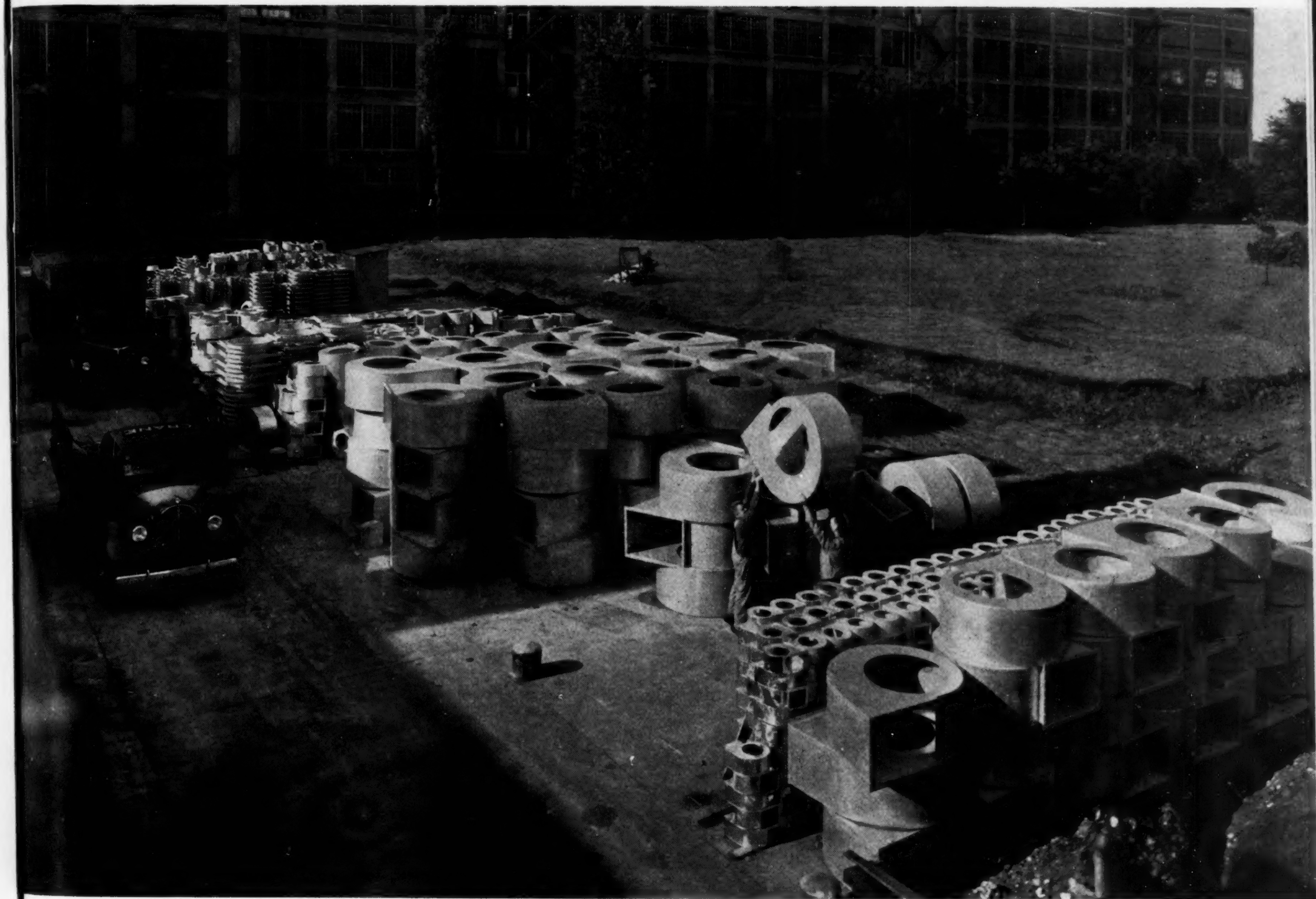
Insulating Materials

Varnished rayon, varnished cotton cloth and varnished nylon have been developed by the Irvington Varnish & Insulator Company for electrical insulation formerly provided by varnished silk. All these materials possess good dielectric strength with tensile and tear strengths equal to or better than varnished silk and can be punched into special shapes. They are available in thicknesses from .003" to .008" in straight-cut rolls or bias cut strips in 51" lengths. Each base material is coated with Irvington special insulating varnish.

High tenacity varnished rayon is the most suitable alternate for varnished silk, comparing favorably with it in strength and flexibility. It has a dielectric strength of 1200 VPM and is used for wrapping leads, small magnetos and coils.

Varnished cotton cloth has greater tensile strength than varnished silk. Its pliability permits application on odd shapes. Dielectric strength is 1200 VPM.

Varnished nylon has qualities of flexibility and high tensile strength with dielectric strength of 1200 VPM. At this time, nylon is only available by government allocation.



PLANT OPERATION AND MANAGEMENT

Ilg Electric Ventilating Co. found out how to get additional war production space without using critical materials for a new building. They built this open-air concrete storage space adjacent to present plant.

Digest of New Methods and Equipment for Chemical Makers

handling shipments of Liquid Chlorine

By Robert J. Quinn
Mathieson Alkali Works

Due to the increased use of chlorine in our war production, more new users are handling liquid chlorine today than ever before. Many of these new users have had little or no previous experience in handling this liquefied gas. While Mr. Quinn's article is intended for such new consumers, it may also be helpful to others as a review of our present knowledge.

Loading a Multi-Unit Tank Car

LIQUID chlorine was first made commercially in the United States in 1909. The original use of chlorine was for preparing bleaching solutions, but its applications multiplied, and, in 1941 a production of 725,000 tons of liquid chlorine were needed to supply the demand.

Since then, the requirements of our war effort have greatly increased the demand for liquid chlorine. It is essential for making or processing some part of almost every item of equipment used by our armed forces, and it also plays a vital part in protecting our troops from infectious diseases.

This increased use of liquid chlorine by new users has naturally increased the number of those who have to deal with it, and, as it is a very active chemical, anyone handling it in large quantities should know how to do so safely.

The Action of Chlorine on Materials

Chlorine, which is a gas at ordinary room temperatures and atmospheric pressure, becomes an amber-colored liquid with a specific gravity of 1.4 when subjected to a pressure of 84 lbs. per square inch at 70°F. When dry and cool, chlorine is inert to most metals, except tin and antimony, but when hot and dry, it attacks all metals. In the presence of moisture, hypochlorous and hydrochloric acids are formed, which attack almost all the metals, with the exception of platinum, silver, lead and certain alloys. Lead, as a matter of fact, is also attacked, but it becomes covered with a protective layer of lead chloride, which resists further corrosion as long as it remains intact.

Practically all organic substances react with dry chlorine, forming gummy chlorinated compounds, but moist chlorine reacts less energetically with this group of materials. Rubber products, for example, are serviceable for handling solutions of chlorine, but moist chlorine gas under low pressure will cause rubber tubing to become hard and brittle.

All the chemically-resistant ceramics withstand the action of chlorine at ordinary temperatures. Fused silica is suitable for handling chlorine at high temperatures, and is the only material, except platinum, that can be used for this purpose.

Further details are summarized in the following table:

Materials Usable for Handling Chlorine At Ordinary Room Temperatures

	Cool, Dry Chlorine Liquid or Gas	Chlorine and Water
Iron	Yes	No
Brass	Yes	No
Bronze	Yes	No
Nickel	Yes	No
Monel Metal	Yes	No
Tin	No	No
Platinum	Yes	Yes
Lead	Yes	Yes
Duriron	Yes	Yes
Hasteoly C	Yes	Yes
Silver	Yes	Yes
Pure gum rubber	No	Yes
Hard rubber	No	Yes
Rubber-lined steel	No	Yes
Chemical stoneware	Yes	Yes
Vitrified brick	Yes	Yes
Tile	Yes	Yes
Fused silica	Yes	Yes

Equipment for Handling Dry Chlorine

For handling dry chlorine, as a liquid or gas, iron, brass or copper equipment is ordinarily used.

Piping for handling the liquid should be of at least ¾ inch extra-heavy black iron, since nothing smaller will provide the necessary rigidity. Valves should be of heavy iron construction with stems, seats and seat rings made of resistant alloys. Because of the action of dry chlorine on organic matter, lubricants should be avoided on valves and other fittings. The graphitized packing recommended by the chlorine manufacturer will provide sufficient lubrication.

In laying long pipe lines for carrying liquid chlorine, it is good practice to provide valves so that sections not over 100 feet long can be shut off at both ends. In planning such lines, however, it must be borne in mind that liquid chlorine expands 0.16 per cent of its volume with every degree Fahrenheit increase in pressure. Hence, a closed-off pipe that is full of liquid chlorine may be ruptured by hydrostatic pressure if it is subjected to a considerable rise in temperature. To avoid such an accident, each individual section of the pipe line should be provided with an expansion chamber having a capacity of at least 20 per cent of the pipe capacity. This should be installed vertically above the pipe.

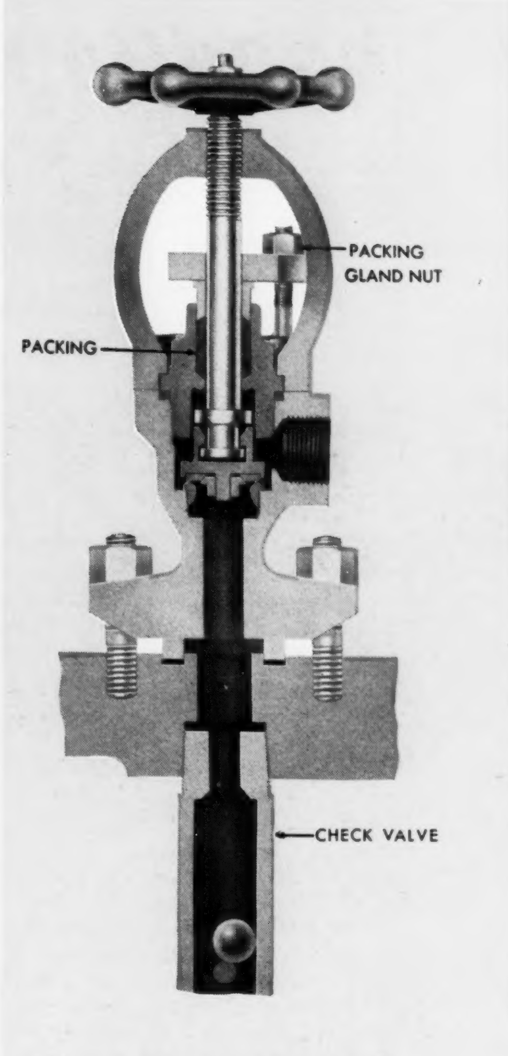
Equipment for Handling Moist Chlorine

In handling chlorine in contact with moisture, as in feeding it into a solution, silver, chemical lead and special alloys are suitable.

While lead is acted upon by alkaline solutions, the reaction is so slow that the life of the lead is sufficient for commercial use. Silver, while more expensive initially, is preferable because of its long life, rigidity and ability to withstand higher pressures.

How Liquid Chlorine is Shipped

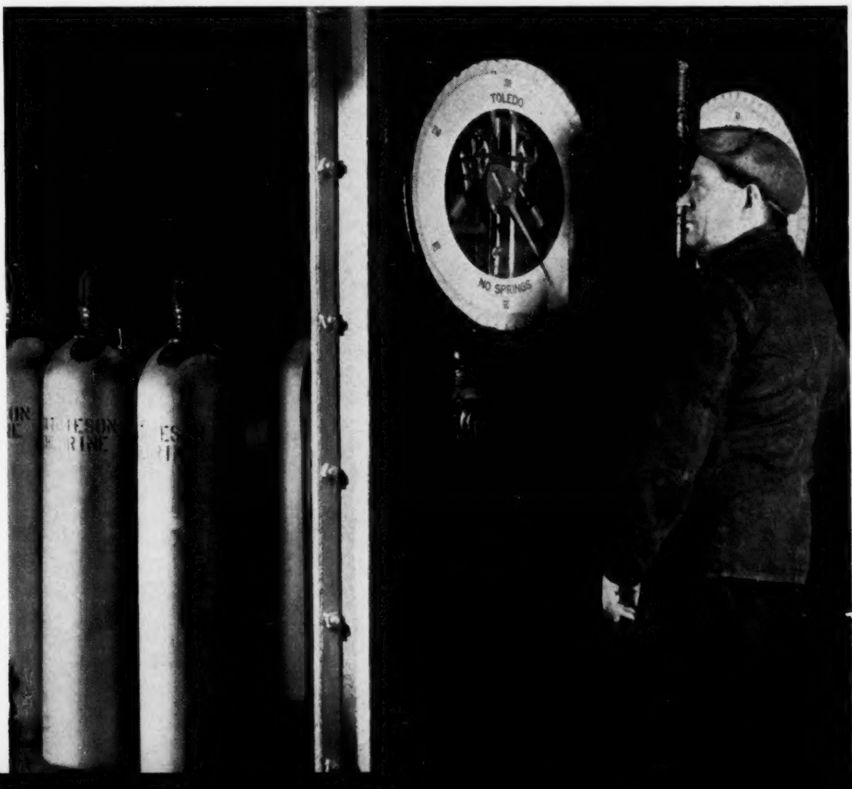
In order to serve the needs of both large and small users, liquid chlorine is shipped in the following containers, all weights being net:



ANGLE VALVE FOR TANK CARS

Figure 1

Filling Chlorine Cylinders



- Single-unit tank cars holding 16 tons and 30 tons.
- Multi-unit cars carrying 15 one-ton containers.
- Cylinders holding 100 lbs., 105 lbs., and 150 lbs.

Tank Cars

To provide flexibility and alternate equipment, each tank car carrying liquid chlorine is provided with four discharge valves located in the dome. Two of these valves draw from the bottom of the car and discharge liquid chlorine, while the other two draw from the top of the car and discharge chlorine gas. A ball check below each liquid valve shuts off the chlorine in case the discharging rate exceeds 5000 lbs. per hour, thus preventing the car from being emptied should the chlorine line be broken. Figure 1 shows the construction of a tank-car valve.

In order to protect their contents from

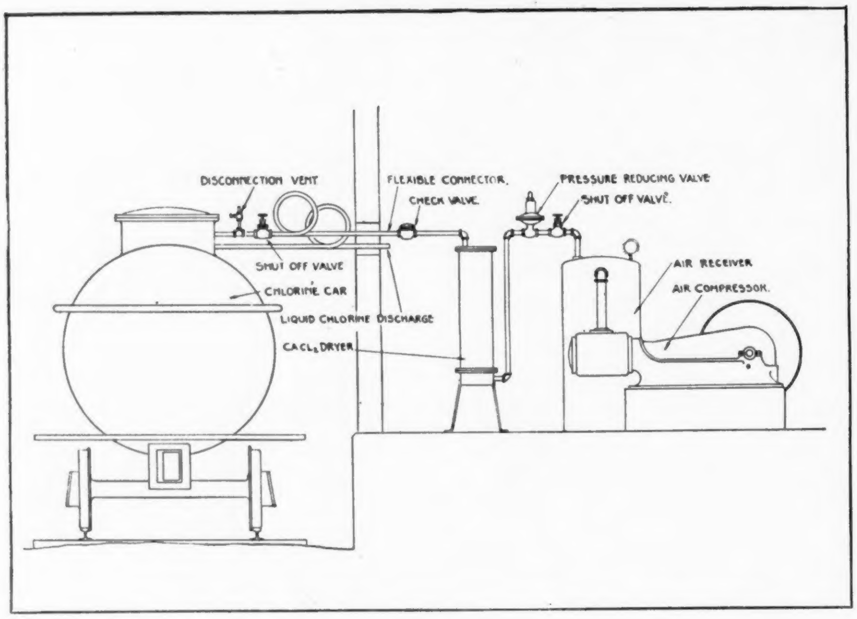


Figure 2

excessive heat or cold, liquid-chlorine tank cars are insulated with five inches of cork.

It is undesirable for the chlorine in tank cars to become heated because this increases the internal pressure. There is, however, no danger of rupture. Cars are loaded with liquid chlorine to only 88 per cent of their total capacity, which leaves a 12 per cent space filled with compressible gas; and, in addition, each car is equipped with a safety valve and a frangible disk set to relieve the pressure when it rises to 225 pounds per square inch.

Cold, on the other hand, reduces the internal pressure, and, if the temperature of the chlorine falls below 50°F., the contents of the car will be discharged sluggishly. Should long exposure to low temperatures cause this trouble, the unloading of the car can be speeded up by applying air pressure. Before the air is introduced into the car, it must be dried by passing it through calcium chloride or another drying agent, and the total pressure of the car (i. e., of the chlorine and of the air) must be kept well below 200 pounds. While the safety valve will not operate until a pressure of 225 pounds is reached, this pressure is greatly in excess of that normally required for satisfactory operation. Experience has shown that most processes can be operated with chlorine pressures not in excess of 125 pounds. When there is an indication that pressures in excess of 125 pounds are required, a thorough study of the chlorine system should be made to determine if the need for such pressures is not a result of an improperly designed system.

In cases where the car is received with low pressure and is air padded to 125 pounds, the chlorine should be withdrawn at a rate which prevents any pressure increase. Under no circumstances should a car be air padded and then allowed to stand unused for an extended period of time. As an example, if a car is padded from 40 pounds (the chlorine pressure corresponding to 33°F.) to 125 pounds and the chlorine then allowed to warm up to 100°F., the total pressure on the car will be in excess of 225 pounds, the operating pressure of the safety valve.

Figure 2 shows a suitable arrangement of air compressor, drier, and other equipment.

Multi-Unit Cars

The multi-unit car is of standard steel-underframe flat-car construction except that it is equipped with cradles to hold fifteen one-ton containers of liquid chlorine. The containers are clamped firmly in place but can be easily released for unloading. As the average full container weighs 3325 pounds gross, a two-ton crane, with suitable tackle, must be available.

One-Ton Containers

One-ton liquid-chlorine containers are steel cylinders with concave ends. Each end carries three fusible safety plugs, which will melt at approximately 157°F. and release the contents of the container, thus preventing the rupture of the container if it is exposed to excessive heat, as in a fire.

As shown by Figure 3, each one-ton container has two valves which are mounted on one of the ends and are equipped with eduction pipes that terminate close to the side of the container. This arrangement permits liquid chlorine to be withdrawn from the lower valve and chlorine gas from the upper, when the container is laid on its side; it also provides a spare valve for emergency use. The valves are protected by a bonnet, which should be removed only when the container is in use.

Figure 4 shows the construction of a ton container valve. It should be operated only with a special wrench provided for that purpose.

Liquid-Chlorine Cylinders

Figure 5 shows the structure of a liquid-chlorine cylinder valve, which is mounted at the top of the cylinder and is protected by a removable steel cap.

To draw liquid chlorine from a cylinder, it must be inverted; to draw gas, the cylinder is stood upright.

Handling Portable Liquid-Chlorine Containers

Liquid-chlorine cylinders and one-ton containers should be handled with the greatest care at all times; it is especially important not to drop them.

They should, if possible, be stored indoors where the temperature is above 50°F., but in no case must they be placed near fires, ovens, steam pipes, radiators, hot-water boilers, or other sources of heat. If stored where they are exposed to low temperatures, they should be moved to locations where they will be heated to 50°F., or more, at least a day before use, in order to insure quick discharge of their contents.

Feeding Chlorine Into Liquid

Figures 6, 7, 8 show three arrangements for feeding chlorine into a liquid in a concrete tank. To be noticed especially are: the flexible connection between the chlorine container and the fixed iron piping,

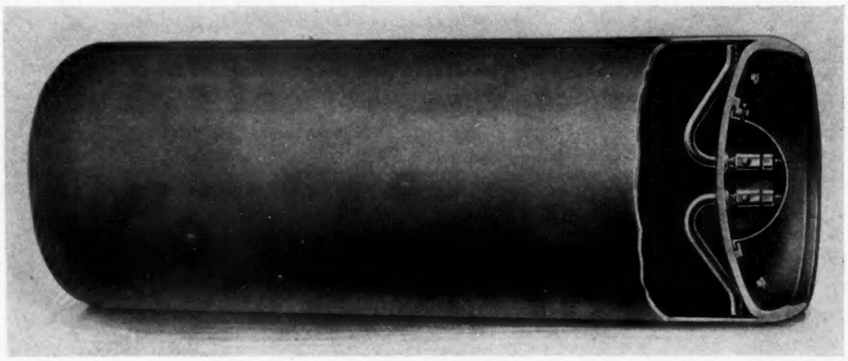
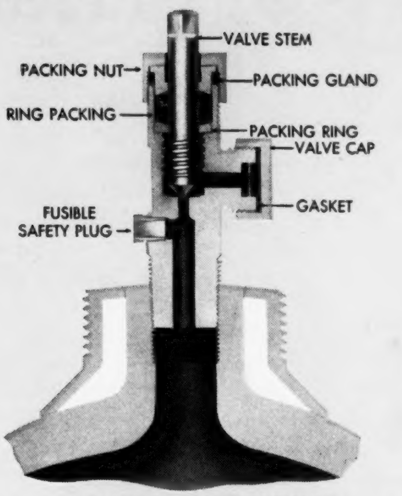
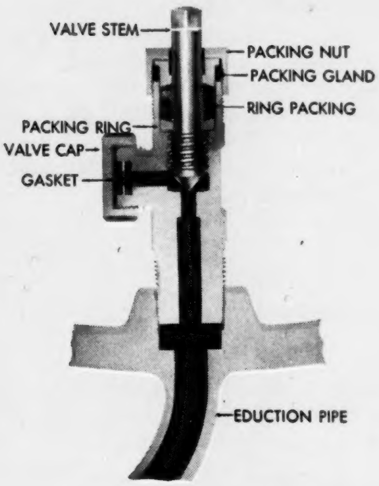


Figure 3



STANDARD CHLORINE CYLINDER VALVE



STANDARD CHLORINE TON CONTAINER VALVE

Figures 4 (Above) & 5 (Top)

which permits weighing the container while in use; the silver or pure lead tubing that leads into the solution; and the automatic vacuum break with a safety vent to the atmosphere.

This last device prevents the liquid from being drawn back into the piping when the chlorine-container valve is closed (as a result of the solubility of chlorine in water) or into the container when the latter is empty. As this sucking-back action will damage equipment, it must be avoided under all circumstances. This can be done by closing a hand-operated valve located at the end of the fixed piping and by closing and immediately disconnecting the chlorine container when it is empty, but in many cases an automatic device is desirable.

The foregoing diagrams apply when the liquid being treated with chlorine is of such a nature, or is of such depth, that all the chlorine is absorbed by it. When necessary, escape of the chlorine into the atmosphere can be prevented by dissolving the chlorine in water before adding it to the solution. Figure 9 shows two ejectors arranged for this purpose.

Vaporizing Liquid Chlorine

In some operations, chlorine gas is desired in larger amounts than can be withdrawn directly from a container. In such cases, the liquid chlorine must first be piped to a vaporizer.

To vaporize 100 pounds of liquid chlorine, 9700 B.t.u.s. are required, which is the equivalent of 12 pounds of steam, or 2.84 kw.hr. of electricity. The actual heating medium used, preferably, should be water, in order to prevent heating the chlorine to the point where it attacks metals. The source of heat for the water, whether steam or electricity, should be thermostatically controlled. It should be mentioned that in vaporizing large volumes of liquid chlorine a steam vaporizer may be used on the advice of the chlorine manufacturer. Figure 10 shows a suitable chlorine vaporizer.

Handling Chlorine Leaks

When the odor of chlorine indicates a leak, only authorized persons wearing suitable gas masks should investigate or attempt to make repairs. All other persons should leave the affected area until safe conditions have been restored.

To locate a leak, pass an open bottle of

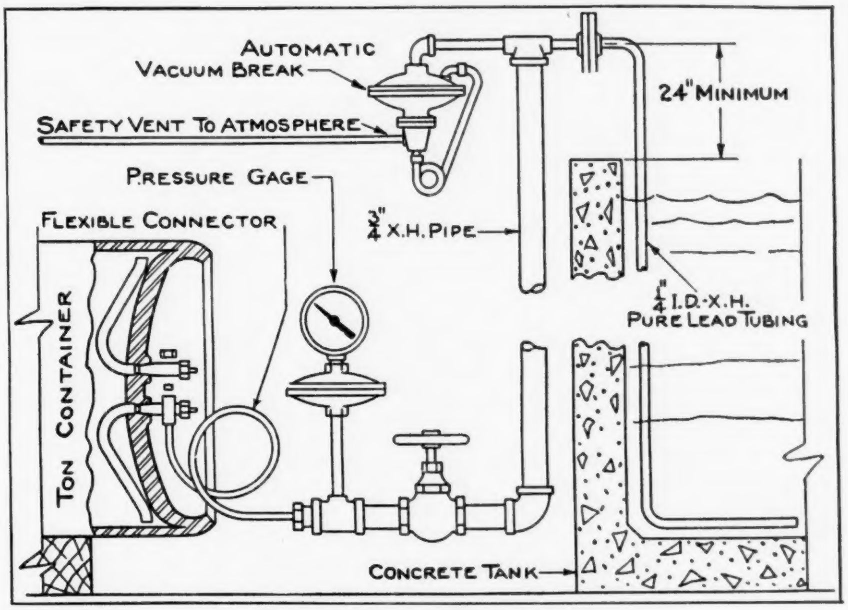
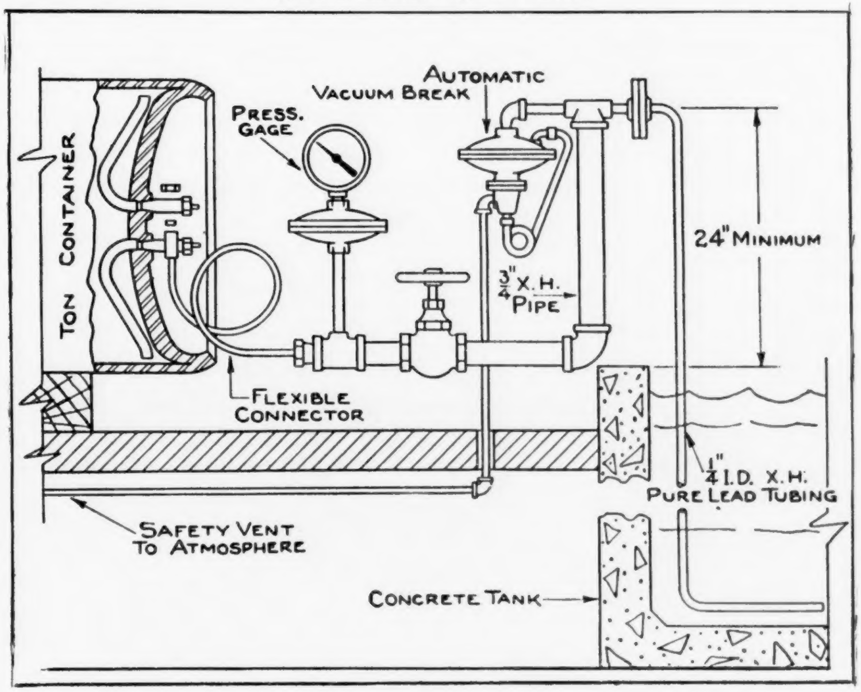


Figure 6 Above, Figure 7 Below



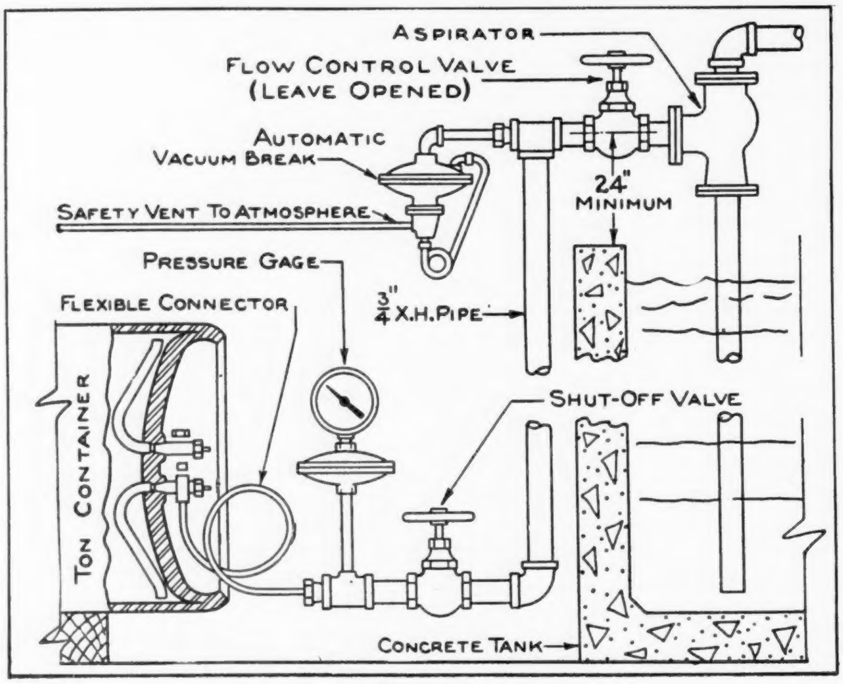


Figure 8

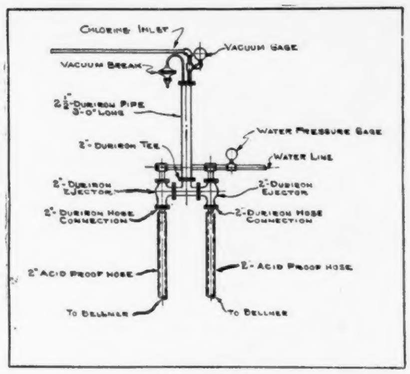


Figure 9

strong ammonia near the suspected points, or use waste or a rag wrapped on a stick and soaked in strong ammonia. A white cloud of ammonium chloride will show the location of the leak.

Leaks around valve stems can often be stopped by tightening the packing nut on each cylinder or ton container valve or the two packing nuts on each tank-car valve. Repacking valves in service should be avoided, but this can be done, if essential, after the valve is closed. Special packing material and instructions must be obtained from the supplier of the chlorine.

A leaking container should be immediately placed with the leak uppermost so that gas, and not liquid, will escape. If possible, remove the container to an isolated, well-ventilated spot.

Packing a cylinder or ton container in dry ice will lower the temperature sufficiently to stop any gas leak, but not a liquid leak.

The rate of gas escape from a leak can be reduced by withdrawing chlorine gas as rapidly as possible from the container and thus lowering the pressure within it. If necessary to make up a solution for the purpose of absorbing the gas, select the proper formula from the following which are sufficient to absorb the entire contents of the containers indicated:

Chlorine gas, being heavier than air, tends to accumulate at the lowest point on the premises. When in the vicinity of a leak, keep the head high and stay to the windward.

First-Aid Measures

Persons overcome by chlorine gas should be removed from the gas area, placed in a warm room, and kept warm with blankets. Treatment consists in administering the standard oxygen and 7% carbon dioxide mixture by means of an inhalator. If respiration has ceased, it should be restored by artificial respiration.

All personnel handling chlorine should be trained in first-aid measures. Gas masks approved for chlorine service by the United States Bureau of Mines should be quickly available in storage places that cannot be reached by the gas, and all persons who may have occasion to use them should be familiar with their use.

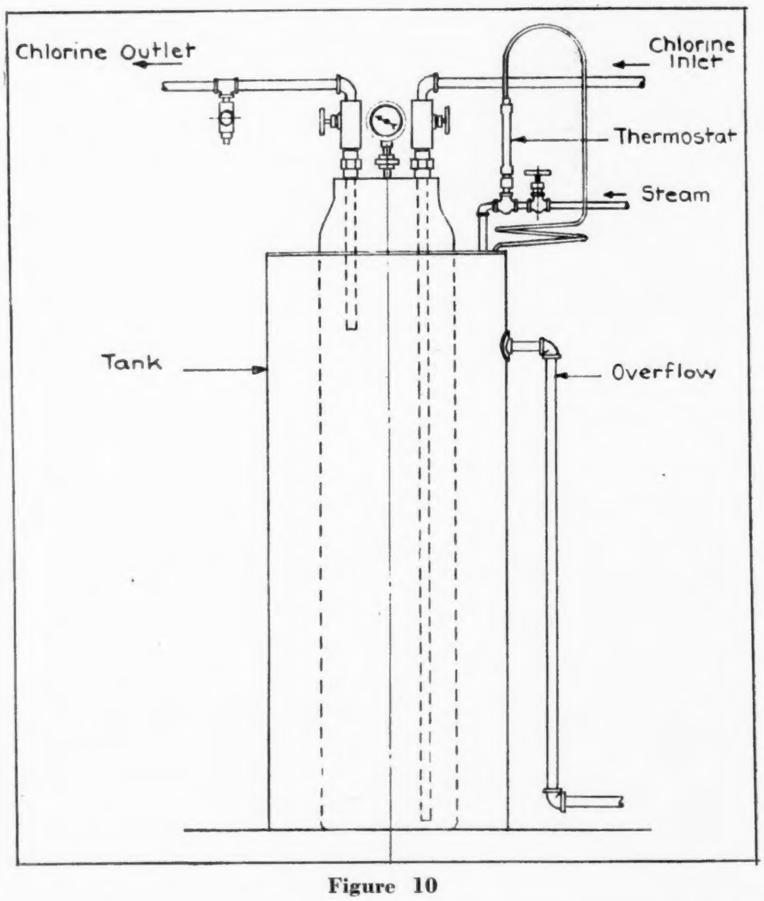


Figure 10

Container	Caustic Soda	Soda Ash
105 lb. cylinder	137 lbs. in 68 gals. water	350 lbs. in 105 gals. water
150 lb. cylinder	195 lbs. in 100 gals. water	540 lbs. in 150 gals. water
One-ton container	2600 lbs. in 1500 gals. water	6700 lbs. in 2000 gals. water

In case of fire in the chlorine storage area, firemen should be warned of the presence of this chemical and shown the location of the containers.

NEW EQUIPMENT

Steam Jacketed Pump QC 207

A new and very much simplified steam-jacketed pump has recently been put into production at the plant of the Blackmer Pump Company, according to a recent announcement.

A number of these new units have been installed in war production plants for handling such materials as palm oil, lard, tar, greases and similar liquids that must be processed or transferred while hot.

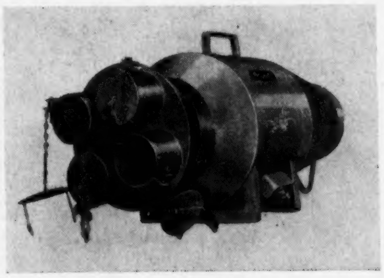
The new steam-jacketed heads are made of cast semi-steel, with threaded intake and exhaust steam ports, and drain plugs. They are suitable for steam pressures up to 125 lbs.

The sleeve bearings supplied with these new pumps are rugged, grease lubricated and located outside the pump casing away from the pumpage. This heavy bearing construction eliminates shaft whip and distortion. Pumps for pressures in excess of 100 lbs. per sq. in. are furnished with anti-friction bearings. The stuffing box glands are of the bolted type with back-off nuts to make repacking a simple job.

Standard Blackmer units in capacities from 20 to 700 GPM and pressures up to 300 lbs. per sq. in. are available with the new steam-jacketed head. They are furnished with either single or double reduction gear drive and as single or multiple pump units.

Exhauster and Blower QC 208

Construction of a new small portable blower unit to eliminate gases and fumes from closed-in places such as shipholds, welding rooms, tunnels, and vaults has been announced by the Chelsea Fan and Blower Company, Inc.



Powered by a ¾ HP ball bearing motor and with heavy steel wheels, the "Octopus Jr." can suck or blow 2,000 cubic feet per minute and will operate in any position. The unit includes adapters for three 4″ nozzles or four 3″ nozzles for flexible hose with caps to close those nozzles which are not in use. Each 4″ metal hose of 20 foot lengths will exhaust 250 CFM; more than 200 CFM will be exhausted by 3″ hose. Of special interest is the portability of this exhauster which weighs but 70 lbs., and can be hung into a small manhole.

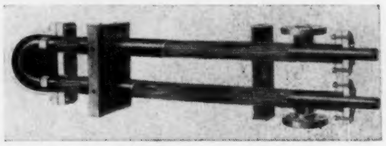
Two-Pen Flow Recorders QC 209

The Cochrane Corporation has developed a new two-pen electric flow meter (actually two complete flow meter receivers mounted within one double depth case) for applications where panel space is at a premium, or where it is desired to have two related flow records on the same chart for ready reference. Both receiver mechanisms can be swung out and operate in the swung-out position. The connection between the rear receiving mechanism and its pen arm must necessarily be detachable and is arranged with a self-aligning V-notch junction.

Where two related measurements are involved, the operator has often sufficient guidance by observing the coincidence (or lack of it) of the two pens. However, this does require that he note which pen is which. For cases where continual reference must be made to this relationship of the two records, ratio indicating pointer can be incorporated. The visible red target moves to right or left from the center point on the scale and thus shows at a glance whether there is an excess or deficiency of one of the quantities with respect to the other. The pointer movement moreover is two and one-half times greater than the difference between the two recording pens and is thus much more readily noted.

Heat Exchangers QC 210

The Brown Fintube Company has announced that it will build and sell complete ready-to-use heat exchangers for the duration, as a service to buyers who are unable, due to the rush of war work, to get needed equipment from their usual sources of supply.



According to a company spokesman, Brown Fintube heat exchangers will be built in all standard types, including the twin section unit pictured above, and in any capacity desired to meet practically any heating and cooling requirement. Brown Fintubes, with welded construction that provides an integral bond of metal between the fin and the central member, said to result in high thermal efficiency and trouble-free operation, will be employed as the heat transfer tube in all cases.

According to the company all heat transfer calculations will be made by engineers newly employed for this particular purpose, who have had long, specialized and successful experience in this work, and having the advantage of the Brown Fintube's heat transfer laboratory for test runs.

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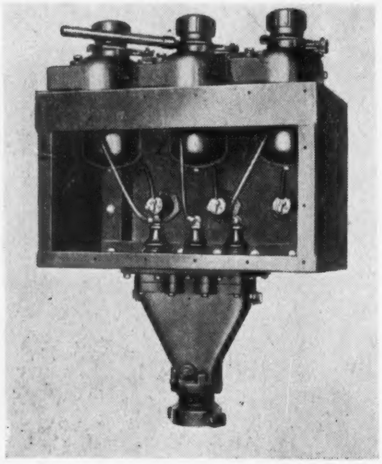
Oil Fuse Cutouts QC 211

A new metal-enclosed assembly of gang-operated oil fuse cutouts for economical short-circuit protection and switching has been announced by the General Electric Company.

The new cutout assemblies permit totally metal-enclosed installations, either single- or three-phase. They are said to save installation labor because each unit is factory-assembled with flexible, insulated cable leads ready for connection to either single- or multi-conductor cable. The leads enter the individual cutouts above the oil level, thus preventing loss of oil. Switching requires merely throwing a lever 90 degrees. Fuse carriers can be removed without disturbing the gang-operating mechanism.



The new assemblies are particularly well adapted for use (indoor or outdoor) in industrial plants for branch circuits, individual transformers or banks, motors, control apparatus, and electric-heating and other equipment. They can be supplied for wall or direct-to-apparatus mounting, with openings for conduit, cable, or pothead connections in the following ratings:

For Short-circuit Protection and Switching		For Switching Only (Copper blade instead of fuse link)	
Volts	*Amperes*	*Volts*	*Amperes*
2500	100, 200, 300	2500	150, 250, 350
5000	50, 100	5000	150, 250
7500	100	7500	150

Steam Generator QC 212

A new steam generator has been announced by the Super Mold Corporation. The company claims that it is simple, compact and efficient and that it needs only fuel and water for automatic operation.

A new principle of water feeding, incorporating jet control, automatically and without the use of thermostats or motor driven pumps, furnishes feed water in direct proportion to the amount drawn off as steam. Once the generator has been lighted it is completely operated by the steam throttle valve or load.

According to the company the generator has only three moving parts, resulting in remarkable simplicity and reliability. The 10 h.p. model will develop 150 pounds pressure from a cold start in less than five minutes. Other models up to 70 h.p. are to be produced. Burners are provided for either gas or oil fuel. No pit is required, and no fire boxes or electrical connections need be installed.

Salt Bath Furnace QC 213

A new electric pot-type furnace, known as the Falcon high temperature salt bath furnace, has been developed by H. O. Swoboda, Inc., for cyanide hardening of tool steel products. Designed for production work and general shop heat treating, this versatile furnace is not only suitable for cyanide hardening but also regular thermal hardening as well. Its operating temperature is 1650° F. In addition, its precision controls permit the operation of the furnace at low temperatures for tempering.

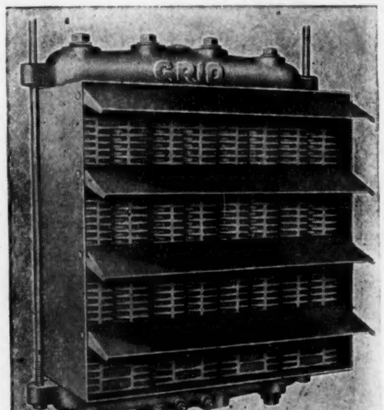
The Falcon high temperature salt bath furnace is provided with throttling-type automatic controls, including a potentiometer-type control pyrometer with an input regulator. A contactor is also provided for carrying the furnace load.

The furnace casing is of steel with an alloy pot which is suspended from the casing into the furnace chamber by means of a heavy cast intermediate ring. Pot dimensions are 16″ I. D. x 18″ deep. The heating elements are supported in open face grooves in high grade refractory heater plates. Brick and block type heat insulation is used throughout.

Terminals are brought out through the casing into an enclosed terminal box located on the back of the housing so that there are no exposed electrical connections at any point on the furnace. Capacity of the unit is 30 k. w., 220 volts, single phase current.

Use Iron in Grid Heater QC 214

To cooperate with the war-effort in using substitute materials the "Grid" Unit Heater is now being made with cast iron heating sections instead of aluminum heating sections, according to the D. J. Murray Manufacturing Co. One of the new units is illustrated here. It is engineered along



the same lines as the "Grid" aluminum heating sections, and engineered and constructed to withstand up to 250 lb. steam pressure. The War Production Board has permitted the use of cast iron in this new unit heater, as a substitute for cast aluminum which has been used since 1929. Being constructed of cast iron this new unit is also free from electrolysis that causes corrosion, leaks and breakdowns, as only one type metal comes into contact with steam or hot water.

* * * * * * * * * * * * * * *

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QC208	QC210	QC212	QC214

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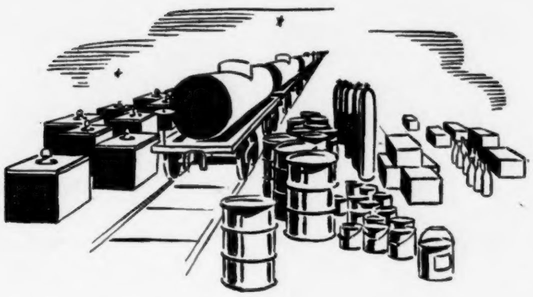

PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Transportation Regulations Amended

THE proposed changes for transportation of dangerous articles listed in the November issue of C. I. with certain emergency additions, were approved by the I. C. C. and become mandatory on Feb. 1, 1943. Shippers may take advantage of these changes any time prior to Feb. 1st next. These changes are:

1. *Hydrochloric acid, anhydrous,* added to the dangerous commodity list as a non-inflammable gas and will be packaged in cylinders.

2. *Sec.* 65 (*j*) (2) *Smokeless Powder.* Fiber containers holding not more than one pound each are added to the (presently authorized) metal cans to be packed not over 10 one-pound containers to a wooden box Spec. 15C.

3. *Sec.* 110 (*b*) (3) *Inflammable Liquids flashing between* 20°F. *and* 80°F. *The Spec.* 5B *Metal Drums* have been deleted from the list of approved containers. These containers are returnable and contain expanded rolling hoops.

4. *Sec.* 113 (*f*) (1) *Paint, Varnish, Lacquer, etc., flashing between* 20°F. *and* 80°F. Fiberboard cans with metal heads of 1 gallon maximum capacity have been added to the list of exempt small containers. These cans must be packed in strong outside shipping containers. This proposal is to last for the present emergency only.

5. *Sec.* 114 (*d*) *Liquid polishes for metal, stoves, furniture and wood*—are exempt when packed in glass or earthenware containers of not over 1 quart capacity or metal containers of not over 5 gallons capacity each, packed in strong outside containers are exempt from packaging and labeling requirements. They are now exempt from marking requirements when shipped by rail or by highway. They are also exempt from marking requirements when shipped by water except as to name of contents and labeling requirements.

6. *Sec.* 183—*Exemptions for inorganic nitrates such as aluminum and ammonium nitrates, etc.*—are covered in this section. Fiber drums are added to the exempt containers. It also increases to 200 lbs. the quantity of ammonium and guanidine nitrate which can be packed in bags and still remain exempt from the Regulations.

7. *Sec.* 204 (*e*) *Sodium hydrosulfite.* For the duration of the emergency the Specification 21A fiber drums may be used without inside containers consisting of metal drums.

8. *Sec.* 253 (*c*) *Chloracetyl chloride.* For the duration of the emergency the I. C. C. 1A or 1C carboys in boxes or kegs are added to the approved list of containers.

9. *Sec.* 264 (*h*) (3) *Hydrofluoric Acid* —14 gauge I. C. C. 5A 55 gallon maximum capacity drums are approved for less carload shipments provided prescribed test requirements are maintained. The present regulation specifies that 12 gauge drums must be used in sizes 20 to 55 gallons.

10. *Spec.* 1*A — Carboys.* Minimum thickness of lumber in carboy box sides and tops is reduced from 25/32" to 1/2". Tops are to be reinforced with 2 one-half inch cleats 4 inches wide. The bottom of the box is to be nailed to 4 nailing cleats which are 25/32" minimum thickness and 2½" wide. These nailing cleats are to form the bottom boards on each of the 4 sides of the box. Corner posts are to have a minimum of 2½" sides.

11. *Spec.* 4*B* (9) (*a*) *Cylinders.* The minimum wall thickness of cylinders over 5" outside diameter is reduced from 0.100 ins. to 0.090 ins.

12. *Spec.* 6*B*. *Returnable metal drums.* The rolling hoops of the 5 to 30 gallon size of 16 gauge metal required are "I" bar or "U" type. This change authorizes expanded, swedged, or rolled hoops.

13. *Spec.* 12*B*. *Fiberboard Boxes.* A special box authorized only for packing poisonous solids class B in 1 gallon metal cans authorized gross weight 84 lbs., is added to this Specification. This box must comply with Spec. 12B except that it must be of the one-piece type, double wall corrugated fiberboard with minimum 400 lb. test and all 3 facings having minimum 135 lb. test.

14. *Spec.* 21*A*—*Fiber Drums.* Because of the present emergency the specified linderman jointed and glued wooden heads is broadened to include wooden heads formed from glued and butt jointed lumber.

The following emergency additions and amendments which were not previously published have been approved:

15. *Sec.* 60 (*b*) (3) (*a*) *Black Powder and Low Explosives*: a new Spec. 13A spiral wound fiber powder keg has been added to the approved list of containers. This change is due to the present emergency.

16. *Sec.* 62 *amending paragraphs* (*b*) (6), (*b*) (7), (*b*) (9), (*b*) (10), (*b*) (16), (*c*) (2). *Blasting Caps and Electric Blasting Caps.* Fiberboard boxes, spec. 23F may be used in lieu of the prescribed wooden boxes spec. 14, 15A, or 16A. This change is due to the present emergency.

17. *Sec.* 173 (*m*) *Potassium Perchlorate*: In addition to the regularly specified packages for inflammable solids Sec. 173 (b) through (1e) bags which are tight and will not permit sifting in transit, have been approved.

18. *Sec.* 272 (*f*) *and* (*m*) *Sulfuric Acid* of 1.5591 specific gravity (52°Be.) or greater strength may now be packed in Spec. 103A tank cars and Spec. MC310 tank motor vehicles.

19. *Sec.* 354 (*b*) *Arsenical Compounds n. o. s.* The spec. 10B barrel authorized for containers for these insecticides may have their steel hoops replaced with wooden hoops of the same type as specified in paragraph 6 of spec. 11A barrels. This change is caused by the present emergency.

20. *Sec.* 361 (*k*) *Class B Poisonous Solids.* Poisonous solids Class B other than those for which special packing is required may be packed in spec. 21A fiber drums maximum loaded capacity 225 lbs. net. These drums must withstand 2 drops from a height of 4 feet in the same spot or one drop from a height of 6 feet in place of the drop test prescribed in spec. 21A. This change merely removes the requirement of an asphalt ply in the sidewall and heads of the drums.

21. Spec. 13A Fiber Kegs. This new specification for a spiral wound fiber keg requires a minimum of 4 plies in the side-

wall with a minimum total thickness of 0.100 inches. The ends are also to have a minimum of 4 plies with a minimum total thickness of 0.120 inches. The tests required are one drop from a height of 4 feet striking diagonally on the head chime onto solid concrete. Four drops from a height of 4 feet striking squarely on the head chime are also required. No one drum must stand both tests.

Textile Bags Controlled

Strict controls over the use of textile bags—particularly those made from burlap and jute fabrics—were imposed on Nov. 3d by the War Production Board with issuance of *Conservation Order M-221.* The order will be in effect for two months, pending further study of the textile bag situation.

The order:

1. Prohibits the use of any type of textile bags—new or used—as sandbags for civilian defense against air raids or "any other act of the enemy."

2. Assures Cuban, Puerto Rican and domestic sugar growers of a continued supply of raw sugar bags for packing their product by requiring that such bags, once emptied, be used for no other purpose than packing raw sugar.

3. Establishes restrictions on the use of bags for packing wool.

4. Curtails sale of new burlap bags to any person to a maximum of 50 per cent of the number of burlap bags sold to that same person in 1941. Excepted from this provision are appeals granted under Order M-47, (burlap and burlap products).

5. Restricts use of new burlap bags to packing the following: barley, beans and peas, chemicals (other than fertilizer), dairy products, mohair, potatoes, rice, rock salt, feeds and meals for animal consumption, fruits, (dried), nuts, seeds, sponges, starch, sugar (raw), wheat and wool and wool products.

The order was issued concurrently with amendments to Order M-107, which set up controls over cotton textiles for bags, and M-47, covering burlap and burlap products. In addition to other changes, the amendments provide that all restrictions on use and distribution of textile bags in M-107 and M-47 be incorporated in the new order, M-221, but other provisions of M-107 and M-47 will continue to be in effect and administered by the Textile, Clothing and Leather Branch as in the past.

M-221, however, will be administered by the Containers Branch.

Other provisions of M-221, of interest primarily to the trade, include:

1. Insurance against damage to both new and used textile bags is provided by the requirement that all bags be opened at the seam or closure by samplers or commercial emptiers. Samplers, however, can probe the contents of a bag if they do not tear or damage the fabric. Also, the order prohibits sales of second-hand textile bags to users unless the bags have been repaired and all holes mended or patched.

Exempted from provisions of the order are cotton textile bags for the Army, Navy, Maritime Commission and War Shipping Administration. In addition, burlap bags made from material set aside in the stockpile under provisions of M-47 are exempt.

The amendment to M-107 (cotton textiles for use for bags), in addition to deleting restrictions on the use of such bags, also makes these two changes in the order: (1) Establishes an A-2 rating for acquisition by bag manufacturers of the fabrics listed in the order. Bag manufacturers can also resell the material to others holding an A-2 rating for use for essential purposes. (2) Use of the rating is extended to Canadian bag manufacturers.

The amendment to M-47 makes these revisions: (1) Burlap can be removed from the stockpile (into which 2/3 of our burlap imports go) on an A-1-c rating or better granted on any of these applications: PD-1A, PD-3A, PD-300, and PD-408. (2) Importers and importing bag manufacturers must make available to non-importing bag manufacturers who bought from them in 1939 and 1940 the same percentage of burlap, compared to total deliveries to non-importing bag manufacturers as in the two specified years. Manufacturers receiving burlap under this provision can put it into process for agricultural bags within 60 days, instead of the previous 30 days allowed.

It was pointed out that the Defense Supplies Corporation has been authorized to purchase stocks of burlap frozen last December by M-47.

Warns Shortages Imminent

Shortages of metals and other packaging materials are a more serious problem to the drug industry than shortage of raw materials used in manufacturing drugs, the industry has been told by WPB officials.

Two industry advisory committees, the Pharmaceutical and the Proprietary Drug, met recently in Washington with WPB officials to consider means of overcoming this serious problem.

The critical shortage of tinplate, terneplate, blackplate steel, and other materials was responsible for the development of some remarkable new containers. Industry should consider using, such things as closures made of glass, ceramics, and of wood. Tubes are now available made of cellulose acetate, with a plastic top and using no metal. Other tubes are made of lead with a lining of paper on each side to prevent contamination of the contents. There are even impregnated kraft paper closures for tubes and bottles.

WPB pointed out to industry members on these committees that although WPB conservation orders still permit them to use metals in packaging to some extent, an even more critical shortage of metals for this purpose is impending, and that the industry should be prepared for it. By converting to non-critical packages at once, it would be possible to start an orderly conversion, and to permit the manufacturers of substitute packages to build up production facilities to take care of the drug industry when the real squeeze comes. Industry-wide conversion could only be accomplished through great increases in non-critical package production.

Both the Pharmaceutical and the Proprietary Drug Industry Advisory Committees will meet with WPB again to report what progress has been made.

Steel Drums Allocated

New steel drum containers and parts in the hands of manufacturers were put under complete allocation control on November 3d by the Director General for Operations.

Purpose of the action is to channel delivery of new steel drums to supply the most essential requirements of the production program.

Sheet steel allotted for the manufacture of steel drums has been found insufficient to satisfy all outstanding orders rated AA-1 or higher, making it sufficient to satisfy all outstanding orders rated AA-1 or higher, making it necessary to exercise tighter control over sale and delivery of the containers.

The order, M-255, prohibits manufacturers from selling or delivering new steel drums and parts (excepting flanges, plugs and cap seals) after November 16, without specific authorization of the Director General for Operations. Likewise, persons manufacturing drums for their own use are prohibited from using any drums which were not completely manufactured before November 16, unless they have similar authorization.

Authorization must be applied for by addressing a letter in duplicate to the Containers Branch, War Production Board, Washington, D. C., marked Ref: M-255. The letter should have a copy of the purchase order attached and should state what the drums are to be used for, what products are to be shipped in them, where they are to be shipped, and the use to which their contents are to be put.

Steel drum containers, used for packing such products as oil and gasoline, are essential for shipment of supplies to the armed forces and for other purposes connected with the war program.

U. S. SIGNAL CORPS PHOTO 123820

THAT familiar phrase "Protected by Crown" takes on a new meaning!

For Crown has furnished and is supplying millions of canisters to hold the filter elements of gas masks for military, naval and civilian use.

"Protected by Crown" never meant more than it does in this case . . . a grim thing to think about . . . but an important part of the big wartime job that the Crown Can organization is doing!

Crown engineers designed and built much of the special machinery required to make these canisters . . . and brought to that task the skill and experience acquired in the production of Crown Cans for more ordinary . . . and more peaceful purposes.

CROWN CAN COMPANY, PHILADELPHIA, PA.
Division of Crown Cork and Seal Company

U. S. SIGNAL CORPS PHOTO 116591

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★ ★ ★ ★ ★ ★ ★ ★ ★ CROWN CAN

PLANT OPERATIONS NOTEBOOK

By W. F. Schaphorst

Pump Efficiency Chart

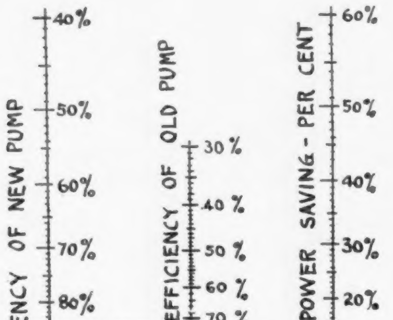
Pump efficiency is important. No pump of course, is 100% efficient because that would mean that the pump would have to be perfect. But there are pumps that are 90% efficient, which means that 90 per cent of the power used in driving the pump is utilized.

An efficiency of 90% is considered "very good"—an efficiency that is not attained by pumps ordinarily used. Most pumps are less efficient than 90 per cent.

But let us suppose that you are dissatisfied with your present pump and you would like to make an improvement. If the efficiency of your present pump is 74 per cent. and you are planning to install a new pump whose efficiency will be 85%, the improvement will not be merely 11 per cent. There will be an improvement of 13% in efficiency.

There is where many pump users make a mistake. It is not uncommon for users and prospective users, even engineers, to subtract the efficiency of the old pump from that of the new one and call the difference the "improvement" in efficiency, but that is not correct. The correct method is to subtract the two efficiencies and then divide the difference by the efficiency of the new pump.

Thus for example 0.85 minus 0.74 equals 0.11. 0.11 divided by 0.85 equals 0.13 which verifies the figures given above.



Let us suppose that you have a pump whose efficiency is only 40% and you are contemplating the installation of one whose efficiency will be 80%. The difference between the two efficiencies is 40%, but that is not the correct improvement. The true improvement, as explained above, is 40% ÷ 80% = 50%.

Herewith is a convenient chart that gives the true improvement or "power saving" without any longhand figuring whatever. Simply run a straight line through the efficiency of the new pump, Column A, and the efficiency of the old pump, column B, and the power saving or improvement in efficiency is instantly given in column C.

Thus for example the dotted line drawn across this chart shows that where the efficiency of the new pump is 85% and that of the old pump is 74%, the improvement, or power saving, is 13 per cent. In other words, by changing from your present 74% efficient pump and installing an 85% efficient pump there will be a saving of 13% in your power bill. The new pump will do just as much work as the old one at 87% of the present cost.

Exhaust Steam

Have you ever noticed that in the summer time it takes less gas to heat your bath water than in winter? Or, if your bath water is always warm but at times not quite warm enough for a bath, have you noticed how little gas it takes to bring the temperature up to where you want it?

That is an important fact that is too frequently overlooked by plant operators and hard-headed business men. The fact contains a worth-while lesson. Most plant operators know that exhaust steam, for instance, contains heat. But many of them do not know that exhaust steam contains the major portion of the heat that was originally obtained from the fuel. Because of this high heat content exhaust steam should always be used in one way or another, if possible.

Steam exhausted into the atmosphere has a temperature of only 212° F. When that temperature is not high enough to do a certain heating job for you, remember the above bath tub experiences. By simply adding some heat to the exhaust you can attain almost any desired temperature. The exhaust is simply run through a superheater or heat exchanger and out it comes—just as hot as needed for your purpose.

A manufacturer who wanted to maintain a temperature of 250° F. in a drying room had been in the habit of exhausting the steam from his simple engine into the atmosphere where it went to waste. He had been using live steam for the purpose because he had been led to believe that live steam was least expensive and that it was the best medium.

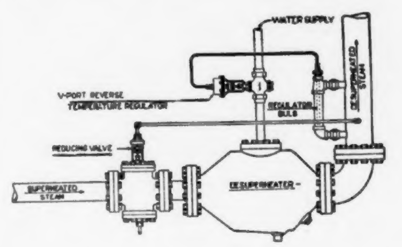
But he has learned a valuable lesson and now he does things differently. He just adds 38° F. to the exhaust steam by passing it through a heat exchanger in the furnace of his boiler, and the required 250° F. is easily attained.

Where exhaust steam can be used in this way it is plain that a condensing engine or a condensing steam turbine would be of considerably less value than the inexpensive, simple, non-condensing engine. It is impossible for a condensing engine or turbine to utilize even 40 per cent of the heat of the steam passing through it. The highest efficiency this writer knows of in steam plants was reported by the Twin Branch of the Indiana and Michigan Electric Co. in 1941. That plant reported an overall thermal efficiency of 33.40 per cent. That is very good, and perhaps the writer should not say that 40 per cent is "impossible" because, some day, it may be attained.

However, what the writer is driving at here is that a simple engine can, by following the method outlined above, utilize nearly 100 per cent of the heat in the fuel by turning the exhaust to some useful purpose in heating coils, heating rooms, drying rooms, and other processes requiring a steady heat, but, in which a steam pressure is not so important. If a higher pressure is needed that, too, can be done—by means of a booster. The important point today is—don't waste heat.

A Simple Desuperheater

Here is a sketch of what the writer regards as being a simple dependable desuperheater. It is made up mostly of standard pipe fittings and a high grade temperature regulator and reducing valve.



As the sketch clearly shows, the superheated steam first passes through a reducing valve which automatically regulates the pressure of the desuperheated steam. A temperature regulator bulb is placed within a sampling by-pass pipe connection as shown, the latter being made up entirely of ordinary pipe and pipe fittings. The regulator bulb causes a V-port reverse temperature regulator to admit the proper amount of water into the desuperheater chamber. In this way the desired temperature and pressure are both attained and maintained for the desired service.

CHEMICAL SPECIALTIES

Here's a photo released by the Office of War Information which shows substitute materials being used for paint containers. Left to right: one-quarter metal can on one-gallon metal can, one-gallon fiber container with metal ends, one-half gallon bottle, one gallon bottle. In the right foreground, pint glass.

Industrial Agricultural Household

N. A. I. D. M. Analyzes Shortages Arising from War Program

29th annual meeting of National Association of Insecticide & Disinfectant Manufacturers holds to theme "What does 1943 hold for us?" Representatives of business, industry and government are speakers. Container and raw materials symposiums show scarcity of tin, natural raw materials.

By Paul Slawter, *Associate Editor*

TO New York City's buzzing Roosevelt Hotel this month came many representatives of the insecticide and disinfectant industry—about 250 in all—for the 29th annual meeting of their association, the N.A.I.D.M. All had one definite question in mind—"What does 1943 hold for us?"

They got the answer to that question, and a great many more, but the picture painted by the fine array of speakers was hardly a rosy one. The members heard, for instance, that the War Production Board Industrial and Household Insecticide and Disinfectant Manufacturers Advisory Committee "was a waste of time and effort." On the other hand they heard that its work was valued and appreciated by the WPB. They heard encouraging reports about quantities of glass containers available but pessimistic estimates on closures. They learned that tin cans were out as far as their industry was concerned but that many substitutes were on the market to take tin's place. They heard of dwindling supplies of natural raw materials on one hand but of increasing production of synthetics on the other. All in all, however, they found the outlook pretty gloomy.

As one member of the National Association of Insecticide and Disinfectant Manufacturers Association put it, "what I came here to find out more than anything is will we (the insecticide and disinfectant industry) survive? Frankly I'm worried about the situation, and like the rest, I have no hesitancy in showing it. I want to know where the war fits into the picture. I want to know if companies working wholly or chiefly in supplying civilian goods will be forced to quit or change the nature of their business. I want to know what the government has on its mind as far as we are concerned."

To this end, the program of the 29th meeting, December 7 and 8, was well-planned and well-executed. The speakers seemed well aware of the questions that were bothering the members and, for the most part, saw that they were answered.

President Sums It Up

John N. Curlett of McCormick & Co. who was re-elected president of the association summed up the industry's feeling about the situation in his opening address. "History is being made today, not only by the armed forces," he said, "but by industry. Modern miracles are being performed. Our industry has a definite function to perform and it can be expressed in three factors: Service, Sacrifice and Cooperation."

He explained that the service was to help maintain the health of our soldiers and our people. Our sacrifice, he said, is a wartime essential and applies to business as well as personal sacrifice. Research in our laboratories will have to be diverted from products for civilian trade to research for products to protect our men at the front. Cooperation through the advisory committee, he went on, has given full benefit to both government and industry.

MacNair Throws Bombshell

Ira MacNair, of MacNair-Dorland Co., threw a bombshell that backfired into the Monday morning session when he declared in an address on "The War Production Board Industrial and Household Insecticide and Disinfectant Manufacturers Advisory Committee" that, in his opinion it was just a wasted effort, a waste of time and amounted to little more than a chance for the industry to "blow off steam." He said that his report was based on a careful study of the committee and its activities and on attendance at its meetings.

Blaming all of its failings on the WPB and not the members of the committee, MacNair told how the first industry request for such a committee had been refused by the Chemicals Branch of the WPB for some unexplained reason. Later, he said, they had a change of mind and asked, again for some unexplained reason, for nominations from which the committee would be selected. The men picked included Brenn, Hamilton, Buettner, Jones, Mayfield, Powell, Williams, Zick and Thompson. First meeting was held July 21 and the committee met monthly thereafter until November. Next meeting is scheduled for July 19, 1943.

Function of the committee, he pointed out, was to be strictly advisory and no powers at all were to be granted to it. This, he said, was a joke because the WPB didn't seem to want any advice and, as far as he was concerned, made no bones about showing it. All meetings were held behind closed doors and, of course, no publicity was issued on any of its activities. He told members whose companies were not represented on the committee not to worry about grinding of axes, however, "because the WPB told the committee nothing anyhow."

MacNair complained that the committee had made several good suggestions but that, as far as he knew, they were never acted on. He pointed to the glass

standardization program as one example. He reiterated the fact that he put the entire blame on the WPB for its seeming attitude toward any advisory committee or toward any advice. The only concrete thing accomplished by the whole setup, he thought, was the expenditure of money for railroad fare and that the members paid themselves.

Answered by WPB

At the conclusion of this rather discouraging report, President Curlett called upon a member of the WPB for comments. This gentleman asked members of the press to withhold his name but out of fairness to both sides his story should be told too. He took pains to point out that the work of the advisory committee was appreciated by the WPB and that its advice was well taken. The glass container standardization, for instance, has been held up by red tape, he admitted. But he promised that such a program could be expected shortly. He said also that there probably would be some provision for price adjustments in container changeover cases but he could give no definite information. Further, he went on, the committee's formation has resulted in the centralization of purchases of the armed forces and in the use of scientific background information to get the army to use certain of the industry's standardized products. He said that the committee's influence had also probably been felt, in a negative way, in the absence of many more "damn fool issuances." "Your committee's advice," he said, "is counted upon heavily."

In this light, it was further brought out, by a later speaker that the WPB has been advised by a "high-up" to consider advisory committees as agencies for advice and to accept them as such. He said that meetings soon will be made public by press releases.

Glass Container Questions

In a question and answer session on glass containers and closures, Hugh J. Crawford of the Glass Containers and Closures Section of the WPB, took the stand and let members throw questions at random. For instance:

Q: When is the glass standardization schedule coming out?

A: I don't know. It is being worked on but we had a little trouble after it was well under way when our legal staff said the WPB couldn't standardize unless it contributed directly to the war effort. The glass industry is still not running at full capacity. Three months have been spent so far getting the problem under control. The food container schedules will be announced first, then the insecticide and chemical lines.

Q: What will the trend be in this standardization?

A: Definitely towards shapes and capacities.

Q: When will the association's request for standardization of certain sizes be acted upon?

A: My guess is January but I can't be sure.

Q: Will we get time to use up containers in stock?

A: Yes, ample.

Q: Is it true that the glass industry has expanded capacity far beyond expectations?

A: No, to the contrary. Only 80 or 85% of possible capacity has been used this year although the industry did work at a higher level than ever before.

The WPB consultant told members they could expect the closure order (M104) about Dec. 14. He explained that it was a positive type of order for every type of container under a metal cap.

In an inspiring speech on "Business at War" upon which he asked not to be quoted, Frank W. Lovejoy, Socony-Vacuum Oil executive, told the audience of his unbounding optimism in the future of this country and of our free type of enterprise. He predicted the end of the war in a year-and-one-half and urged business to keep its name in front of the public if it wanted to survive after the war.

First part of the afternoon session was devoted to reports of the various association committees. Dr. A. E. Badertscher, McCormick & Co., who is chairman of the Insecticide Scientific Committee announced that Professor Hazard of Wilmington College, Wilmington, Ohio, has raised a crop of bedbugs upon which he will conduct tests of various products at a nominal fee. He urged members to use this opportunity for experimentation.

Metal Cans Out

Another question and answer session was conducted at the afternoon session, this time under the leadership of R. B. Solinsky, chief, metal can and collapsible tube section, WPB. Among the questions and answers were:

Q: Explain the new conservation order which is soon to be issued.

A: Insecticides are out. (As far as tin cans are concerned.)

Q: Will we be able to use the cans we have on hand?

A: Not if they are in excess of your quota.

Q: Does this include both black plate and tin plate?

A: Yes.

Q: What about lye and bowl cleaners and drain flush products?

A: Cans will be allowed on a 50% basis for six months.

Q: Suppose we have army or navy orders?

A: You can get cans for government orders.

Solinsky here pointed out that if a producer has no cans on hand and regularly solicits army and navy (government) orders which usually must be filled quickly, the producer can ask for a letter of intent which will give him a supply of cans against potential government orders.

The next speaker was a WPB specialist and his topic was "The Chemical Situation" but here again, censorship regulations prohibit the reporting of any of his remarks. In fact, the speaker said, "I'd rather you didn't even mention that I was here at all." One thing he said which can be reported is that government purchases of insecticides and disinfectants are now centralized. Address J. W. Fielding, Jersey City GMC, Harborside Terminal, Jersey City, N. J.

Materials Symposium

At an insecticide materials symposium some hope was expressed for better supplies of pyrethrum in the middle of 1943. Rotenone, it was said, would probably be called upon to do some substituting for pyrethrum wherever possible. Thanite supplies will be good as there is no shortage of any of the domestic raw materials which make up this product. Pyrin, a product which is made from pyrethrum and a castor oil derivative, does not have so bright an outlook. A new insecticide material which looks promising, soon will be brought out by John Powell & Co., it was announced. Velsicol, which extends the use of concentrates, comes from a supply limited to present capacity. This might be subject to increase next year. Raw materials for this product are readily available but transportation problems might prove a bugaboo here, it was pointed out.

Dr. R. C. Roark, chief of the Insecticide Investigations, Bureau of Entomology and Plant Quarantine, pictured new fields of potential insecticides in his address. In the inorganic branch he proposed that for the scarce sodium fluoride, silicofluoride of soda could be used. It has disadvantages, he admitted, in that it does not powder as easily but he showed that three pounds would do the work of four of sodium fluoride. The disadvantages can be overcome, he said, and the product will be more abundant in 1943 than it was in 1942.

On the organic side, Dr. Roark said, the patent literature shows about 1400 developments of which 339 are thiocyanates. He said that so far, no one synthetic compound had been developed which was a complete substitute for pyrethrum. He mentioned the use of sesame oil to pyrethrum extract as an extending principle which also enhances the value of the mixture. It is believed, he said, that a number of the new synthetics used as

horticultural insecticides will prove useful as household insecticides.

Tuesday Session Lively

Tuesday morning a symposium on disinfectant and sanitary products brought together F. U. Rapp, Hercules Powder Co., J. A. Schade, Innis, Speiden & Co., and a representative of Shell Oil. Rapp said that early reports indicate that natural pine oil production may drop off 10 to 15 per cent as compared with 1942 production. Scarcity of labor and overburdened transportation facilities will be responsible for any curtailment in production, he said.

Any reasonable reduction in natural pine oil production will be counterbalanced with synthetic production. Synthetic pine oil celebrated its first anniversary this month. During this year economies have been made and production methods improved. These factors have resulted in an appreciable reduction in cost to the consumer. On December 1, 1941, synthetic pine oil was made available at 16½ cents per pound in tank cars in the South. In June, 1942, it was reduced to 10 cents per pound. Today, it can be procured at 7.7 cents per pound in tank cars in the South, he went on.

Consumers should realize that normal purchases throughout the new year will enable pine oil producers to distribute the 60,000,000 pounds of pine oil equitably to all industries. Periodic purchases in moderate quantities for consumption only will permit producers to deliver pine oil at a rate that will keep everyone supplied with this basic raw material through 1943.

The wax situation was described by Schade as one of scarcities due to shipping. He said that no steamers had been allotted to carry carnauba from Brazil until recently after a long period. They are now en route and if they get here this will be the first shipment to arrive since July. There is plenty of carnauba in Brazil if we could only get it here.

The situation in uricury, he said, was not so bad. Supplies are limited but shipping is from a different port than carnauba. He said that this wax could be used for carnauba in pastes and polishes, etc. Candellila is difficult to obtain, the trouble here being with the producers union in Mexico. A settlement is expected soon when the present union gets dissolved by the government and a new one set up.

Petroleum products were said to be in pretty good condition. Supplies of Stoddard's Solvent will be ample. Cresylic acid supplies will be about in the condition as 1942.

Officers Reelected

Present officers of the association were reelected for 1943. John N. Curlett is president, Henry A. Nelson, 1st vice-president, Gordon M. Baird, 2nd vice-president, John Powell, treasurer, and H. W. Hamilton, secretary.

Elected to the board of governors were John Marcuse, C. M. Furst, N. J. Gothard, Melvin Fuld and Friar Thompson.

Full program follows:

Monday, December 7—Morning Session, J. N. Curlett, presiding.

9:00 A. M. Registration.

10:00 A. M. Meeting called to order.

Address of the President—J. N. Curlett, McCormick & Co.

Report of the Treasurer—John Powell, John Powell & Co.

Report of the Secretary—H. W. Hamilton, Kopper Co.—White Tar Division.

Report of Membership Committee—Chairman, Henry A. Nelson, Chemical Supply Co.

"The War Production Board Industrial and Household Insecticide Manufacturers Advisory Committee"—Ira P. MacNair, MacNair-Dorland Co.

Appointment of Committees.

Election of Nominating Committee.

Introduction of Guests.

Roll Call.

"Questions and Answers: Glass Containers and Closures"—Hugh J. Crawford, Consultant, Glass Containers and Closures Section, Container Div., War Production Board, Washington, D. C.

"Business at War"—Frank W. Lovejoy, Socony-Vacuum Oil Company.

12:30 P. M. Group Luncheon.

Monday, December 7—Afternoon Session, J. N. Curlett, Presiding.

2:00 P. M. Meeting called to order.

Report of Insecticide Scientific Committee—General Chairman, Dr. A. E. Badertscher, McCormick & Co.

Mothproofing Committee — F. W. Fletcher, Dow Chemical Co.

Cattle Spray Committee—F. C. Nelson, Stanco, Inc.

"Base Oils"—N. J. Gothard, Sinclair Refining Co.

"Insecticide Testing Method"—Dr. C. W. Kearns, Department of Entomology, University of Illinois.

"Questions and Answers"—R. B. Solinsky, Chief, Metal Can and Collapsible Tube Section, War Production Board, Washington, D. C.

"The Chemical Situation" — Melvin Goldberg, Specialist, Insecticides and Fungicides, War Production Board, Washington, D. C.

Insecticide Materials Symposium.

Pyrethrum—Harold Noble, S. B. Penick & Co.

Rotenone—R. B. Stoddard, Dodge & Olcott, Inc.

Lethane—D. F. Murphy, Rohm & Haas Co.

Thanite—Friar Thompson, Jr., Hercules Powder Co.

Pyrin—Alfred Weed, John Powell & Co.

Velsicol—A. R. Jameson, Velsicol Corp.

"New Potential Insecticides" — Dr. R. C. Roark, Chief, Insecticide Investigations, Bureau of Entomology & Plant Quarantine, U. S. Department of Agriculture, Washington, D. C.

"Agricultural Marketing Administration During Wartime"—Dr. E. L. Griffin, Insecticide Division, U. S. Department of Agriculture, Agricultural Marketing Administration, Washington, D. C.

"Dry Skim Milk as a Food for the Adult Fly"—by F. W. Fletcher and Eugene E. Kenaga. Presented, by title only —F. W. Fletcher.

Adjourn.

Tuesday, December 8—Morning Session, H. A. Nelson, Presiding.

10:00 A. M. Meeting called to order.

Report of Disinfectant Scientific and Standards Committee—Dr. E. G. Klarmann, Lehn & Fink Products Corp.

*Disinfectant and Sanitary Products Symposium.**

Pine Oil—F. U. Rapp, Hercules Powder Co.

Waxes—J. A. Schade, Innis-Speiden Co.

Petroleum Products—Shell Oil Company.

Report of Nominating Committee.

"Questions and Answers" — L. J. La Brie, Office of Price Administration, Washington, D. C.

*Container Symposium.**

American Can Company.

Aridor Company.

Owens-Illinois Glass Co.

Wilson & Bennett Mfg. Co.

Thomas W. Dunn Company.

St. Regis Paper Company.

N. P. Dana.

"Relation of Bureau of Foreign and Domestic Commerce to the Insecticide Industry during Wartime"—N. L. Marwood, Chemicals Staff, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington, D. C.

12:30 P. M. Group Luncheon.

Tuesday, December 8—Afternoon Session, J. N. Curlett, Presiding.

2:00 P. M. Meeting called to order.

Proposed Wax Specifications and Method of Test—Dr. R. B. Trusler, Davies-Young Soap Co., Chairman, Sanitary Specialties Scientific Committee.

2:30 P. M. "News of the Day"—John W. Vandercook, NBC News Commentator.

"Disinfestation of Aircraft"—Surgeon Gilbert L. Dunnahoo, U. S. Public Health Service, Washington, D. C.

Election of Officers.

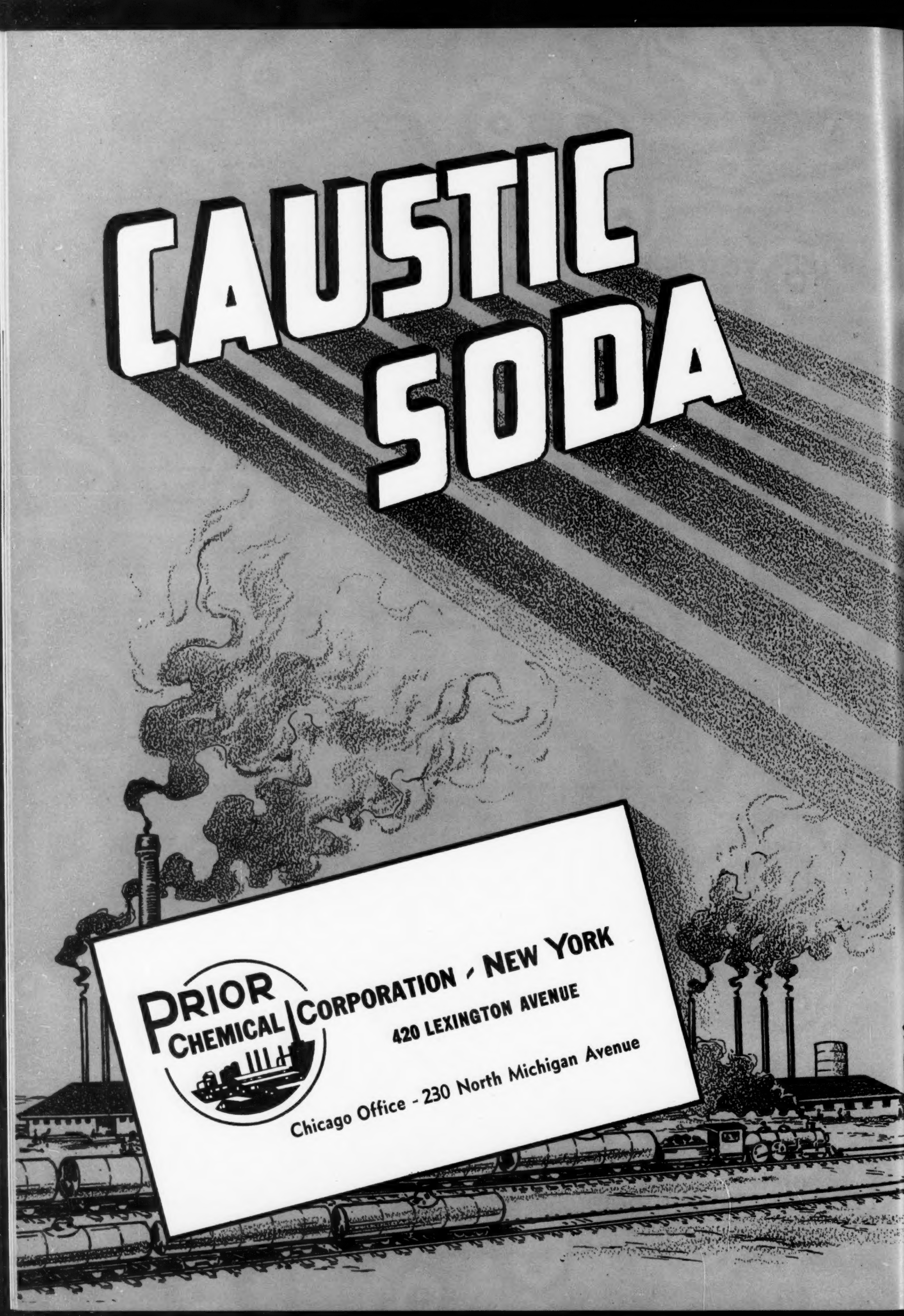
Report of Resolutions Committee.

New and Unfinished Business.

Adjourn.

Annual Informal Dinner—7:00 P. M.

*Firms other than those listed were called upon to contribute to these symposiums.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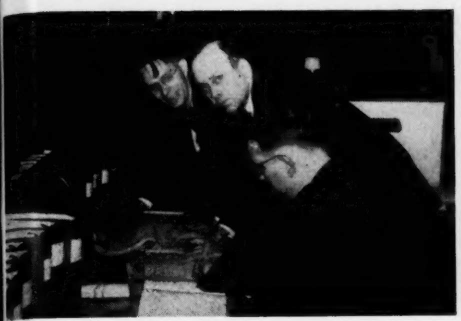
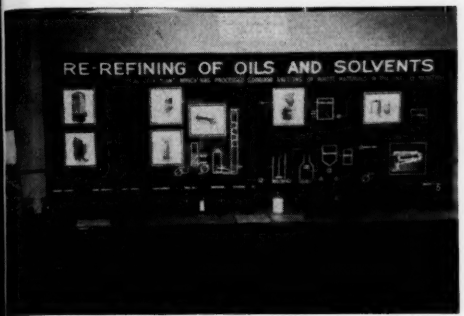
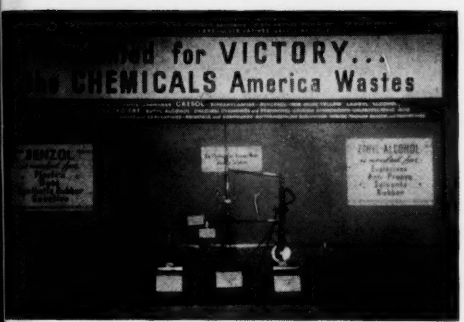
SODA
PRIOR
CHEMICAL
CORPORATION - NEW YORK
420 LEXINGTON AVENUE
Chicago Office - 230 North Michigan Avenue

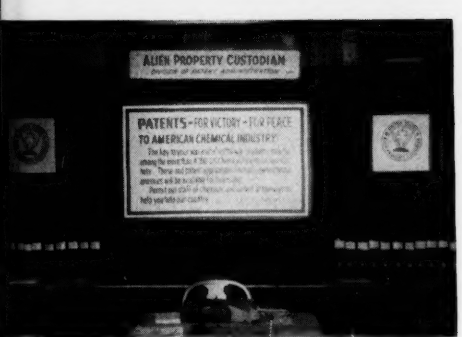


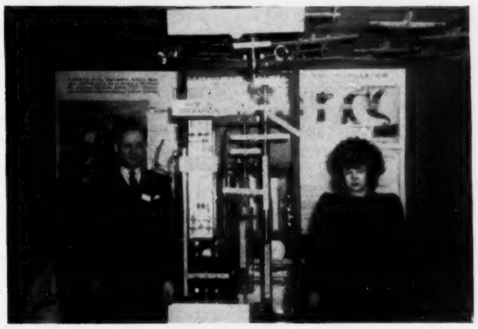
Chemists and Industrialists Swamp National Chemical Exposition

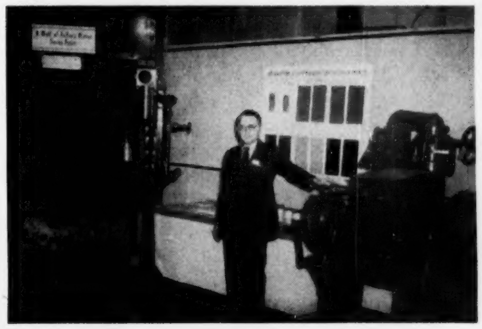
CI took these pictures at the National Chemical Exposition, Hotel Sherman, Chicago, Nov. 24 to 29. At the left, from top to bottom are shots of the War Production Board's booth which, in space contributed by the Exposition, showed how industry could help win the war. Center photo above was taken at the joint meeting of the National Industrial Chemical Conference and the Chicago Section of the American Chemical Society (which sponsored the Exposition). Presiding was R. C. Newton, vice-president, Swift & Co. Top right is *Chemical Industries* booth, "New Chemicals for Industry."











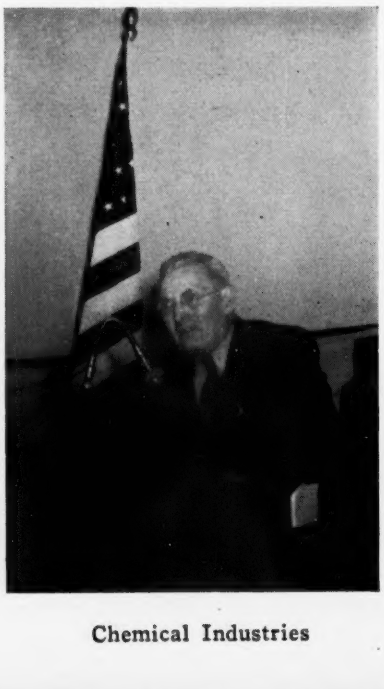
Top right, girls at the Exposition booth handing out programs and supplements. Right center, Mr. and Mrs. Podbielniak of the Podbielniak Centrifugal Super Contactor Co. at their booth. Below right, another part of the War Production Board booth demonstrated a paint sprayer booth and a method of recovering the solvents and pigments ordinarily lost from paint-spray processes, and reconditioning them for further use. Originating in one of the large automobile plants as a measure to protect the health of workers, this process is now making a large contribution to the war effort by conserving critical materials.

. . . and more pictures of the National Chemical Exposition

Top left, C. G. King, scientific director of the Nutrition Foundation, who conducted the meeting on "Food and the Relation of Food to the Chemistry of Plants and the Soil." Below him, F. W. Mohlman, director of laboratories, Sanitary District of Chicago, who spoke on "Waste Treatment in Industry as Related to War Economy" at a symposium on industrial war problems. Below him, S. Donald Perlman, executive director, Industrial Salvage Section, WPB, who spoke on "The Salvage and Conservation of Chemicals in Industry" at the same symposium. Lower left, Ward V. Evans, professor of chemistry, Northwestern University, who spoke on "Control of War Time Incendiaries."

Top right, Percy C. Kingsbury, Chief Engineer of General Ceramics, reposes at his company's booth. Below him, Miss O'Brien at the U. S. Stoneware booth. Below her, Ralph L. Ericsson of Commercial Solvents answers a question about the nitroparaffins.

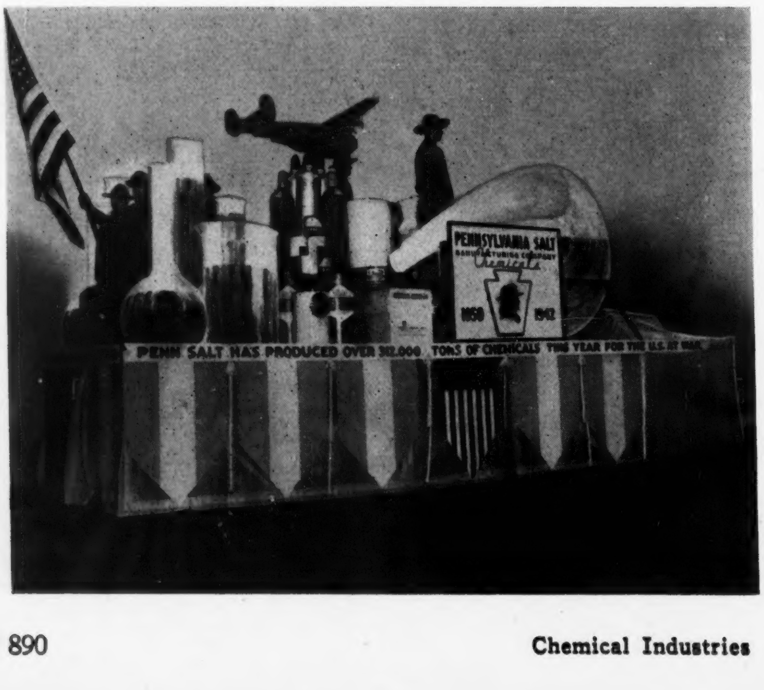
Bottom left, Professor Anton J. Carlson of the University of Chicago rises to bring up a point in the discussion on nutrition. Bottom right, so does Dr. Harry N. Holmes, past president of the A.C.S.



Here and There in the Industry

Here's a girl, an employee at the Westinghouse Lamp Division, who invests more than 50% of her wages in war savings bonds. How's your quota?

Left, GE photoelectric recording spectrophotometer being used to measure color of sample of yellow paper. Curve is being drawn automatically on drum at left. Below, left, Products of Pennsylvania Salt Manufacturing Co. were displayed on this float in the Navy Day Parade at Philadelphia. Below, Westinghouse "electronics" workers check temperature inside long glass bottles which contain parts for high power radio tubes for the armed forces. They are heated under vacuum to remove all traces of gas.



NEWS OF THE MONTH

COMPANIES

Koppers Builds a Huge One

(Passed by the U. S. Censor)

A huge plant which will produce the ingredients for making one-seventh of the 1,000,000 tons of synthetic rubber annually called for by the government will be completed by the Koppers Co. and operating at full capacity in the Fall of 1943. The plant is being built for the Government on a Defense Plant Corp. contract and will be managed and operated by the Butadiene Division of the Koppers United Co.

Work began on the plant in April, 1942. Some units will begin to produce about May, 1943. The huge plant, which covers some 200 acres of ground, is located in the Beaver Valley below Pittsburgh.

Raw materials to be used are coal and agricultural alcohol. About 73,000,000 gallons of alcohol will be consumed yearly by the plant at full capacity. Products made will be styrene from coal and butadiene from alcohol. These will go into the making of Buna-S synthetic rubber. The government's synthetic rubber program calls for 85% of the total to be made of this type.

Capacity of the new plant will be 37,500 short tons of styrene annually and 80,000 short tons of butadiene.

Another "E" for Monsanto

Monsanto Chemical Co. has been notified by the War and Navy Departments that the men and women of its Monsanto, Ill., plant, its St. Louis plant and Chemical Warfare Service, St. Louis plant No. 1, at Monsanto, Ill., which is operated by the company for the government, had received the joint Army-Navy "E" award for their "fine record in the production of war equipment."

Acquires Amino Products

International Minerals & Chemical Corp., Chicago, through its subsidiary companies has acquired ownership of Amino Products Co., Detroit. Amino operates a large chemical plant at Rossford, Ohio, a suburb of Toledo, where it produces mono sodium glutamate and glutamic acid products and derivatives.

International also has under construction at Cincinnati a plant for the manufacture of potassium chemicals. Acquisition of Amino adds materially to its expanding production of chemicals.

Manpower Will Win, He Says

The government has finally taken the step which will win the war in its recent deposition of the manpower problem into the hands of Paul V. McNutt, Dean Frank C. Whitmore of The Pennsylvania State College, told the Rotary Club at Tyrone, Pa., Dec. 7. For almost six months, he said, we were forgetting that in modern war a smaller army with more to throw at the enemy is far better than a greater army with little more than its own bravery and its bayonets.

The manpower muddle will end, he predicted, because the necessary power is localized in one man. No longer will arsenals and ordnance plants and essential civilian activities be handicapped by having necessary men enlist or be taken away by some Local Draft Board, he said. Now we can all go ahead with new courage and faith.

Westinghouse at Peak

Westinghouse Electric & Manufacturing Co. at its current tonnage rate is delivering enough material to fill 4,900 freight cars in a single month. Company has stepped up its monthly production from $34,000,000 worth of equipment last January to more than $52,000,000 in October, and to meet this schedule has added more than 1,500 new employees every month during the past year.

Philgas Offices Move

General offices of Philgas Division, Phillips Petroleum Co., were moved Dec. 11 from the General Motors Building, Detroit, Mich., to Phillips' principal operating offices at Bartlesville, Okla.

Detroit tank car section of Philgas Division will continue the present district sales and service office in the General Motors Building—similar to the other district offices now maintained at New York, Philadelphia, Chicago, Milwaukee, St. Louis, Bartlesville and Amarillo. The Detroit district office is under the direction of W. F. DeVoe.

Rolls Changes Name

Rolls Chemical Co., Inc., Buffalo, N. Y., announces that effective Jan. 1 the company name will be changed to Commercial Chemicals, Inc. There is no change in corporate structure or management.

Woburn Opens New Unit

Woburn Degreasing Co. of N. J. opened its new synthetic drying oil unit for the making of Conjulin, a quick drying oil produced from domestic materials, Dec. 7.

Before the war tung oil from China was largely used as a quick drying base in these paints and varnishes. With tung oil now almost completely unavailable, new synthetic drying oils from domestic products had to be devised.

Another Synthetic Plant

Another of the large scale government-financed synthetic rubber plants has just begun production operations the B. F. Goodrich Co., Akron, O., reports.

The new plant, located in Kentucky will ultimately utilize butadiene made from alcohol and will shortly be in full scale production of general purpose synthetic rubber for use by the armed forces of the United Nations.

duPont Has High Safety Record

The Seaford Plant of E. I. du Pont de Nemours & Co., Inc., worked the largest number of hours without a reportable injury in the recent Chemical Section Annual Safety Contest sponsored by the National Safety Council. Sixty-four plants went through the contest period which was from July 1, 1941, to June 1, 1942, without a reportable injury.

Participation, at 223 plants, exceeded all previous competition. Average frequency rate for all participants, according to the report just issued, was 6.26. In comparison with previous competition, rates averaged 16% higher. Small plants on the whole, it was noted, had the highest frequency rates and also the worst results in comparison with previous contests.

Phillips Has New Process

Phillips Petroleum Co. announced recently that more materials for synthetic rubber and more aviation gasoline could be extracted from crude oil under a new catalytic refining process developed by its scientists.

Request Color Code

The War Production Board and the National Machine Tool Builders Association have requested the American Standards Association to begin work immediately on a standard color code for lubricants as a war emergency project.

Sees Wider H_2SO_4 Use

The war is likely to reverse the recent technical trend of reducing the use of sulfuric acid in industry, according to a report to the North Jersey Section of the American Chemical Society by Dr. H. F. Johnstone of the University of Illinois, authority on the recovery of sulfur dioxide from waste gases. The consumption of sulfuric acid may be much greater after the emergency than it was before, Dr. Johnstone predicts.

Recovery of sulfur dioxide, the industrial uses of which are nearly as varied as those of sulfur itself, from dilute

smelter gases is now accomplished in this country as well as in Europe, Dr. Johnstone says. The annual wastage of sulfur from this source, however, is still over 2,500,000 tons, it is estimated.

"E" for Solvay Process

The Army-Navy "E" for outstanding accomplishment in the production of war materials was awarded to the men and women of the Hopewell, Va., plant of the Solvay Process Co., subsidiary of Allied Chemical & Dye Corporation, at a ceremony held at the plant on Nov. 11.

Hopewell plant produces synthetic ammonium nitrate, essential for explosive manufacture, as well as other synthetic nitrogen products.

Filtrol Corp. Moves

Filtrol Corp. has moved its general offices to 634 South Spring St., Los Angeles, Calif.

Crowley Controls Patents

All transactions between private persons or companies involving U. S. patents and copyrights in which any foreign country or foreign national has an interest now are subject to control by Leo T. Crowley, Alien Property Custodian. Heretofore, this control has rested in the Treasury Department.

All patent applications, assignments, licenses, and other agreements affecting foreign-owned patents are included in the controls.

The Custodian has issued three general orders and supplementary regulations setting up a complete regulatory system for transactions that are subject to his control.

Search for Rubber

Hundreds of scientists and technologists are collaborating in the nation's quest to discover rubber bearing plants which can be grown on a large scale in North America, according to a report to the American Chemical Society by Dr. H. L. Trumbull of the B. F. Goodrich Co., Akron, O., one of the leaders in the project. Fundamental research, it is pointed out, may provide new techniques for the recovery of rubber from both domestic and foreign plants.

Urge Graduates to Register

Following recent increases in demand for technically-trained personnel, the National Roster of Scientific and Specialized Personnel recently urged senior and graduate students of chemistry, physics, engineering, and other specialized fields to register their skills. The principal national professional and scientific societies are constantly cooperating with the National Roster to stimulate complete registration in their respective fields.

Analyzing Coal Oils

Continuing a long-range study of the hydrogenation of coal to produce gasoline, lubricating oil and other related products, Bureau of Mines chemists now are engaged in analyzing the crude oils made from coal to determine their possible uses in various fields of American industry, according to Dr. R. R. Sayers, Director of the Bureau of Mines.

In advising Secretary of the Interior Harold L. Ickes of the publication of a new technical paper on the subject, Dr. Sayers pointed out that the Bureau has been producing gasoline and oil from coal on a semi-commercial scale at the Pittsburgh, Pa., pilot plant for some time, and that a number of American coals have been tested as to their suitability for use in the process.

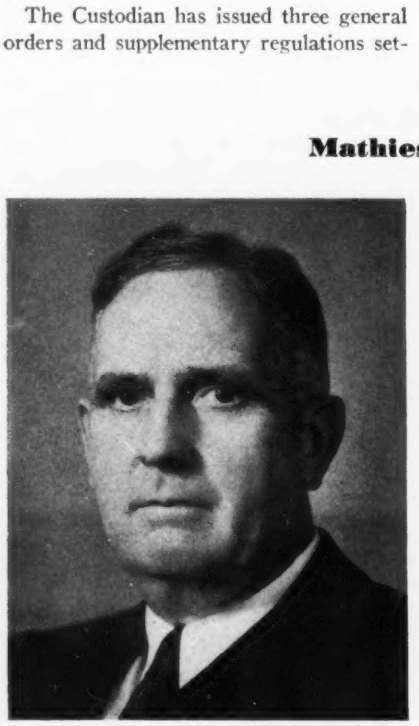
Acquires Harmon Works

Acquisition of the Harmon Color Works, East Paterson, N. J., as a wholly owned affiliate, will enable American Home Products Corporation to increase materially its capacity to meet war demands for sulfonamides and other pharmaceuticals, V. J. Chartrand, president of Harmon Color Works, announced last month, following announcement of an exchange of stock arrangement between the two companies.

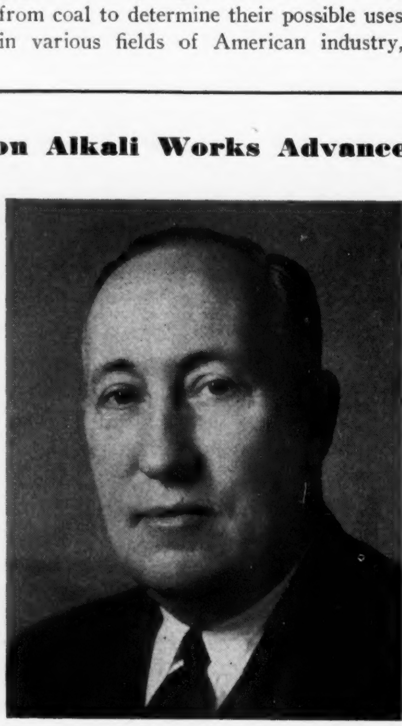
"Home Guard" Writes to Boys

The "Home Guard," the organization formed by the employees of Rumford Chemical Works to write letters and send gifts to the men in the service, has its own self-supporting newspaper, "The Works." Sent free to men in service and to their families, the little mimeographed sheet is sold at 10c a copy to members of the Home Guard, with a resulting profit for the Service Fund.

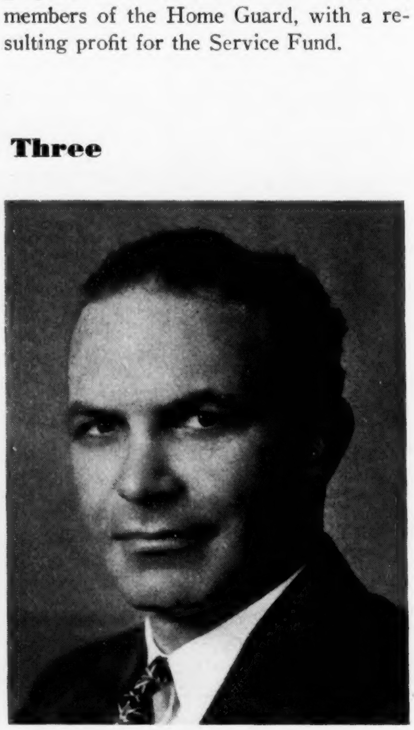
Mathieson Alkali Works Advances Three



Esse E. Routh



Robert J. Quinn



D. W. Drummond

Mathieson Alkali Works, Inc., N. Y. City, announced retirement of John A. Kienle, vice-president—director of sales. Esse E. Routh has been elected vice-president—director of sales. Robert J. Quinn becomes assistant to the vice-president—director of sales. D. W. Drummond has been appointed general manager of sales.

Lydon in Service

The partnership of Calo & Lydon has been dissolved following Mr. Lydon's entry into military service and the business will be carried on under the firm name of John H. Calo Co., 19 Rector St., N. Y. City.

Need Chemists in Industry

The United States has only one trained chemist per 2,000 population, whereas Germany has three per 2,000, Dr. Carl F. Prutton, head of the chemical engineering department at Case School of Applied Science, told the Cleveland Engineering Society Dec. 4 at the Founders Day banquet. For that reason, he pointed out, great precautions should be taken to exempt chemists from military service.

ASSOCIATIONS

Paint Club News

Annual Christmas party of the Cleveland Paint, Varnish & Lacquer Association was held Dec. 18 at the Hotel Carter. Ellis E. Busse was chairman of the program and entertainment committee.

Annual "Hi-Jinx" party of the Golden Gate Paint & Varnish Production Club was held Nov. 13 at the Music Box, San Francisco, Calif. Seventy members and guests were present.

Eighth annual Christmas party of the New York Paint, Varnish & Lacquer Association was held Dec. 10 at the Hotel Biltmore. George A. Melven was chairman of the program and entertainment committee.

Los Angeles Paint and Varnish Production Club heard Dr. R. B. Stringfield, well-known authority on polymerization reactions in the resin and rubber fields, speak on "Synthetic Rubber and Rubber Substitutes" at the December meeting.

Cincinnati-Dayton-Indianapolis-Columbus Paint & Varnish Production Club had as speaker for the December meeting Charles Bogin of Commercial Solvents Corp. who spoke on Plasticizers and Solvents.

S. Werthan of the New Jersey Zinc Co. spoke on "Interior Resin-Oil Emulsion Paints" at the December meeting of the Baltimore Paint & Varnish Production Club.

Regular meeting of the Louisville Paint & Varnish Production Club was held Nov. 19, fifty members and guests attending.

John Gehant introduced the guest speaker, F. G. Oswald of the Technical Service, Hercules Co., whose topic was "Pentalyn Resins."

Chicago Rubber Group Meets

Chicago Rubber Group met Nov. 27 in the Sherman Hotel. J. W. Crosby, sales manager of the Thiokol Corp., spoke on "Outstanding Properties of Various Types of Thiokol." Dr. J. C. Patrick, the inventor of Thiokol, was also present at the meeting.

Annual Christmas Party of the Chicago Rubber Group was held Dec. 18, in the Morrison Hotel, Chicago.

Williams Chairman of DCAT

Organization meeting of the newly elected executive committee of the Drug, Chemical & Allied Trades Section of the N. Y. Board of Trade, Dec. 10, resulted in the election of the following officers to serve for the next fiscal year: Chairman, Victor E. Williams, eastern sales manager, Monsanto Chemical Co.; vice-chairman, Charles C. Caruso, vice-president, Schieffelin & Co.; treasurer, Robert B. Magnus, vice-president, Magnus, Mabee & Reynard, Inc. (re-elected). Carl M. Anderson, assistant secretary, Merck & Co., Inc., was re-elected counsel, and John C. Ostrom was re-elected secretary.

Retiring chairman, S. Barksdale Penick, Jr., president of S. B. Penick & Co., automatically becomes a member of the section's advisory council, to succeed Joseph A. Huisking, vice-president, Fritzsche Brothers, Inc.

Consultants Meet

Association of Consulting Chemists and Chemical Engineers, Inc., held a "Conference on War Service" Dec. 7, 1942 at the Electrical Testing Laboratories, Inc., New York City. Meeting was attended by independent consulting chemists and chemical engineers and privately owned laboratories.

Wittmann Addresses SCI

Konrad F. Wittmann, chief of the Industrial Camouflage Division, Pratt Institute, spoke on "Industrial Camouflage" at a meeting of the American Section of the Society of Chemical Industry held jointly with the American Institute of Chemical Engineers at the Chemists' Club, N. Y. City, Dec. 4.

Kinzel Speaks on Steel

New York Section of the American Institute of Chemical Engineers met at the Chemists' Club, N. Y. City, Nov. 27. Speaker of the evening was Dr. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories and Senior Consultant, conservation division, WPB. He discussed the significance of wartime developments for the future of the steel industry.

California Salesmen Celebrate

Chemical Salesmen's Association of California held its annual Christmas party Dec. 11 at the Music Box, San Francisco.

Ball Speaks on Plastics

At its Dec. 18 meeting at the Chemists' Club, the New York Chapter of the American Institute of Chemists will hear Dr. Ralph H. Ball, who is with Plastics and Synthetic Rubber Section, Chemicals Branch of the War Production Board in Washington. His subject included "Raw Materials Supplies for Plastics Manufacture."

In 20-Year Club

M. Stanley Barker, metropolitan New York sales manager for Magnus, Mabee & Reynard, Inc., and Miss Maryanne

Become Monsanto Board Members

Dr. Charles Allen Thomas (left) and Ozborne Bezanson, have been elected to the board of directors of Monsanto Chemical Co. Dr. Thomas is director of the Central Research department of the company and Bezanson is vice-president and general manager of Monsanto's Texas Division.

James, assistant to the treasurer, were inducted into M. M. & R's 20 Year Club Dec. 2.

New Chemical Group

Neal D. Becker, president of the Commerce and Industry Association of New York has announced the creation of two new committees. One is on drugs and chemicals, to study matters relating to their production, distribution and legislation, affecting this field. The other committee is on post-war planning.

Membership of the chemical committee follows:

Dr. W. S. Landis, American Cyanamid Co., chairman; Edward B. Austin, Thos. Leeming & Co.; John A. Garvin of Merck & Co.; Robert H. de Greeff, R. W. Greeff & Co.; G. M. Kaufmann, Mutual Chemical Co. of America; John A. Larkin, Celanese Corporation of America; C. T. Lipscomb, Jr., McKesson & Robbins; Harvey M. Manss, the Bayer Co.; John Powell & Co.; William H. Sheffield, Innis, Speiden & Co.; A. L. van Ameringen, van Ameringen-Haebler; Charles F. Walden of Thurston & Braidich; A. A. Wasserscheid, Mallinckrodt Chemical Works, and R. Righton Webb, W. J. Bush & Co.

PERSONNEL

W. R. Hucks, manager of the raw materials division of B. F. Goodrich Co., **R. G. Boyd,** manager of planning and scheduling in the tire division, and **R. J. Hull,** assistant manager of compounding in the tire division, have all been loaned by the company to the government and will assume posts in organizations administrating the nation's synthetic rubber program . . . **L. W. Hutchins,** president of Sheldon, Morse, Hutchins & Easton, Inc., and director of Safety Research Institute, Inc., has been appointed chief of the newly organized education unit in the fire defense section of the U. S. Office of Civilian Defense . . . **William C. Carter,** for 14 years vice-president and for the past year executive vice-president of Link-Belt Co., has been elected president succeeding **Alfred Kauffmann** who has resigned because of ill health.

U. S. Wants Photos

The United States Government is anxious to obtain photographs of foreign locations which might be of aid to the War Effort. Pictures of Industrial Plants, Landmarks, Railways, Coasts and Harbors, etc., are particularly desired.

If you or anyone within your acquaintance has such photographic material (also applies to motion pictures) in his possession and wishes to loan this to the Government, please write as follows:

OFFICE OF STRATEGIC SERVICES,
Pictorial Records Division,
1600 Broadway, New York, N. Y.
and questionnaire will be mailed.

Cox Joins Lederle

Herald R. Cox, formerly Principal Bacteriologist of the U. S. Public Health Service, Rocky Mountain Laboratory, has joined the staff of Lederle Laboratories, Pearl River, N. Y., as Associate Director of Research in charge of virus and rickettsial diseases.

Drake With Velsicol

Velsicol Corp., Chicago, has appointed **Milton J. Drake** to manage its resin department and supervise technical sales. He will establish a separate laboratory at the company's Chicago headquarters and will work largely on problems of the paint, varnish and lacquer field.

Leonard to WPB

Lawrence C. Leonard of the Chemicals Division, War Production Board, has been appointed chief of the distribution section of that division.

Brannin Promoted

D. P. Brannin, who has been in charge of metal sales for New Jersey Zinc Sales Co. i the Chicago area, has been appointed district sales manager of the pigment and metal sales divisions, with headquarters in Chicago. **J. P. Dunphy,** of the New York Sales Department, has been named district sales manager, pigment division, with headquarters in N. Y. City.

Huston Promoted

Charles L. Huston, Jr., director of personnel relations of Lukens Steel Co., Coatesville, Pa., and a member of the company's Board of Directors, has been appointed assistant to the president of the company, **Robert W. Wolcott.**

New Superintendent

John H. Merriam, formerly research chemist for Sherwin-Williams, has been made superintendent of the Columbia Park chemical plant of International Minerals & Chemical Corp.

With Warwick Chemical

David E. York, formerly of the Sandoz Chemical Co. has recently joined the staff of the Warwick Chemical Co., in West Warwick, R. I. as Director of Application Research.

Directs Ethone Research

Dr. Walter R. Meyer has been made technical director of the Ethone Co., New Haven, Conn. From 1929 to 1931 he was plant chemist of Sargent & Co., 1931 to 1938 he was with GE.

Allison with Battelle

Adrian G. Allison, former ceramic engineer of the Electro Refractories & Alloys Corporation of Buffalo, New York, has been appointed to the research staff of Battelle Memorial Institute, Columbus, O., and assigned to its Division of Ceramic Research.

Kammermeyer to Publicker

Dr. Karl Kammermeyer, since 1939 assistant professor of chemical engineering at the Drexel Institute of Technology, has been engaged by Publicker Commercial Alcohol Co., Philadelphia, as director of chemical and chemical engineering research.

Pfluger Promotion

Walter Pfluger, Rumford Baking Powder's District Manager for N. Y. City for the past two and one-half years, has been made district manager for all New England.

Joins International

Donald N. Utesch has joined the sales staff of the chemical department of International Minerals & Chemical Corp., Chicago. For the past eight years, Utesch has been with the Speare Supply Co. Formerly he was with Armour & Co.

M. M. & R.'s Chicago Head

For the fourth successive year the Chicago offices and warehouse of Magnus, Mabee & Reynard, Inc., have been enlarged. Talmadge B. Tribble (above) is M., M. & R. vice president in charge of the Chicago operation.

Join Controllers Group

James R. Arthur, assistant to comptroller of the Tobacco By-Products & Chemical Corp., Louisville, Ky., and **Charles M. Timblin,** auditor of Charles Pfizer & Co., Inc., New York, have been elected to membership in the Controllers Institute of America.

House Advanced

William R. House, Owens-Illinois Glass Company sales executive, has been made branch manager of the Buffalo, N. Y. sales office of the company.

Dr. Morgan Appointed

Appointment of Dr. D. P. Morgan as director of the chemicals division of the WPB was announced last month by Ernest Kanzler, Director General for Operations.

His appointment releases Dr. Reid, the former director, for his new appointment as Director of the Commodities Bureau.

Fetherston in Army

Franklin R. Fetherston, who for the past 15 years has served as secretary and treasurer of Compressed Gas Manufacturers' Association, Inc., and its affiliate Liquefied Petroleum Gas Association, Inc., has been granted a leave of absence to assume active duty with the Army of the U. S.

Skinner Now Chief

Dr. William W. Skinner has been appointed chief of the Bureau of Agricultural Chemistry and Engineering to fill the vacancy left by the death of Dr. Henry G. Knight last July.

Smith with Battelle

Karl F. Smith has been named to the research staff of Battelle Memorial Institute, Columbus, Ohio, and has been assigned to its Division of Industrial Physics.

Shapiro Joins Warwick

Leonard Shapiro has joined the staff of the Warwick Chemical Co., West Warwick, R. I.

MISCELLANY

New Hygiene Members

Election of four new members to the Board of Trustees of Industrial Hygiene Foundation, which recently held its seventh annual meeting at Mellon Institute, Pittsburgh, are announced. They are:

Ned H. Dearborn, Executive Vice Pres., National Safety Council; Prof. Philip Drinker, Harvard School of Public Health; Lt. Col. A. J. Lanza, M.C. Chief, Occupational Hygiene Branch, U. S. Army; Dr. C. B. Selby, Medical Consultant, General Motors Corporation.

Grants Fellowship

Sylvania Industrial Corp., Fredericksburg, Va., has granted a research fellowship in cellulose chemistry to Hutton W. Theller, a graduate of the University of California and at present a candidate for the Ph.D. degree in the Department of Pulp & Paper Manufacture, N. Y. State College of Forestry at Syracuse University.

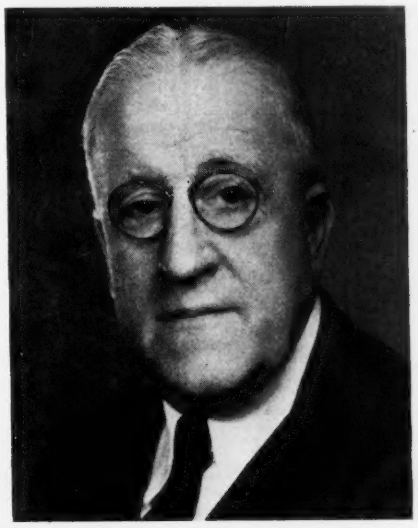
Applied Moves

Applied Chemical Corp. has moved offices and laboratory to 6-8 East 39th St., N. Y. City. Phone, Murray Hill 3-0017-8.

OBITUARIES

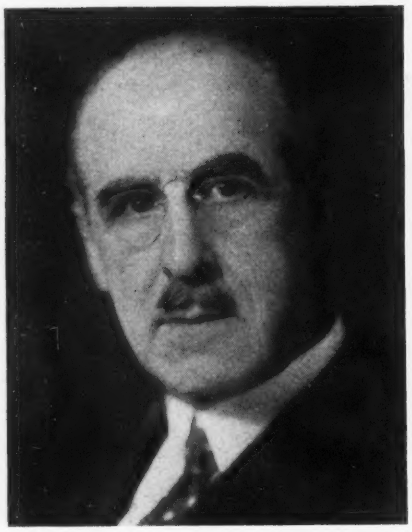
Harry J. Schnell, president of the Schnell Publishing Co., Inc., N. Y. City, and editor and publisher of *Oil, Paint and Drug Reporter* and *National Painters Magazine,* died unexpectedly Nov. 29 in the Orange Memorial Hospital, Orange, N. J. He had been under the observation of his physician following what apparently was not an alarming coronary attack a week earlier. He was 67 years old and for 52 years had been associated with the publications of which he became owner in April, 1941.

Schnell was fifteen when he got a job in 1890 with the late William O. Allison, publisher of *Oil, Paint and Drug Reporter,* the old *Painters Magazine* and *The Druggist Circular.* Working long hours as an assistant in the mailing department of the *Reporter,* Schnell studied at night and completed courses in business practice and business law. His first promotion put him in the editorial department and the next into the business department; then he became progressively assistant to the general manager, business manager for all three publications and then general manager.



Harry J. Schnell

He was born in New York Feb. 15, 1875. His father came to this country from France. In 1898, Mr. Schnell married Miss Sara Jane Bainbridge. She died in 1912. A son, Harry J. Schnell, Jr., of the chemical division of the War Production Board in Washington, and a daughter, Mrs. William Stuart Auchincloss, of Short Hills, N. J., survive.



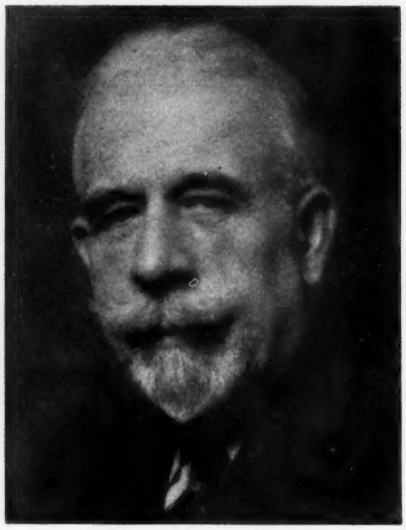
Frederick M. Becket

Frederick M. Becket, a former member of the consulting editorial board of CHEMICAL INDUSTRIES and former vice president of the Union Carbide and Carbon Corporation, with which he had been connected since 1906, latterly as a consultant, died Dec. 1 in Roosevelt Hospital at the age of 67.

For his achievements in metallurgy Dr. Becket received the Perkin Medal of the Associated Chemical and Electro-Chemical Society, 1924; the Elliott Cresson Medal of the Franklin Institute, 1940; a Modern Pioneers Award of the National Association of Manufacturers, 1940, and the Acheson Medal of the Electro-Chemical Society, 1934.

He was president of the Electro-Chemical Society in 1926, of the American Institute of Mining and Metallurgical Engineers in 1933, of the Chemists Club in 1939.

Dr. Becket was a Fellow of the American Association for the Advancement of Science, a member of the American Chemical Society, Mining and Metallurgical Society of America, American Society for Metals, Iron and Steel Institute of London, American Institute of Chemical Engineers and the New York Academy of Sciences; also the Chemists Engineers and Mining Clubs of New York and the Niagara Club of Niagara Falls, N. Y.



Harrison E. Howe

Dr. Harrison E. Howe, for 21 years editor of *Industrial and Engineering Chemistry*, publication of the American Chemical Society, and one of the best known members of the American chemical profession, died Dec. 10 at his home in Washington, D. C. Dr. Howe, who would have been 61 years old Dec. 15, had been suffering from heart trouble since last Spring, although he was active until last month.

On Nov. 6 in New York City, Dr. Howe received the medal awarded annually by the Society of Chemical Industry for "valuable application of chemical research to industry."

Dr. Howe, who was chairman of the advisory committee of the Chemical Section of the War Production Board and a Colonel in Reserves, Chemical Warfare Service, was born in Georgetown, Ky., on December 15, 1881. He received the bachelor of science degree from Earlham College in 1901, and did graduate work at the University of Michigan. He held honorary degrees from the University of Rochester. Southern College, Rose Polytechnic Institute, and the South Dakota State School of Mines.

Before becoming editor of *Industrial and Engineering Chemistry* in 1921, Dr. Howe was associated with Arthur D. Little, Ltd., Montreal, Canada, and Arthur D. Little, Inc., Cambridge, Mass. He also had been associated with the Bausch & Lomb Optical Company, Rochester, N. Y., from 1904 to 1916, and was chemist of the Sanilac Sugar Refining Company, from 1902 to 1904.

He was editor of the A.C.S. series of "Technological Monographs," the author of "The New Stone Age," "Profitable Science in Industry," and other scientific works, and of many magazine articles. He served as general conference and round table leader at the Institute of Politics, Williamstown, Mass., in 1926 and 1929. He was widely known as a lecturer. Dr. Howe maintained a summer home at Woods Hole, Mass., and a farm in Richmond, Indiana.

He is survived by his wife, the former May McCaren, whom he married on October 17, 1905; two daughters, Mrs. Oscar Provost and Mrs. F. B. Clinton of Washington, D. C., and five grand-children.

HARRISON E. HOWE

The science of chemistry has suffered an irreparable loss in the untimely death of Dr. Harrison E. Howe. He possessed the very special ability of being able to interpret all scientific progress either in the minutest of details required and necessary to the work of the technologist, or in its broader aspects, so as to be wholly understandable to the layman. But quite aside from his distinguished scientific and journalistic achievements Dr. Howe's winsome smile, ready but ever-kindly wit, his almost boyish eagerness, his inspiring voice and mannerisms will live on indefinitely in the memories of his contemporaries. No man who has done so much for his fellow man really dies. His monument is erected in the hearts and in the minds of the countless thousands who have been so deeply inspired by him.

William T. Penniman

William T. Penniman, 57, vice-president and general manager of the explosives department of Atlas Powder Co., died Dec. 9 in Beebe Hospital, near Wilmington, Del., after several months illness.

Bennett B. Bristol

Bennett B. Bristol, 74, who with his brother Edgar H. Bristol founded the Industrial Instrument Co., in 1908, which later became the Foxboro Co., died at his summer home at Falmouth Heights, Mass., November 10, following several months' rest from a heart attack, suffered last May.

T. L. Taliaferro

T. L. Taliaferro, general manager of Phoenix Metal Cap Co., died of a heart ailment, Nov. 17, 1942, at his home in La Grange, near Chicago, Ill. He was 62 years of age.

A. B. Gerber

A. B. Gerber, chief chemist of the Trenton, Mich., plant of Monsanto Chemical Co., died suddenly Nov. 22 from a heart attack. He was 50 years old.

William S. Farish

William S. Farish, 61, president of Standard Oil Co. of New Jersey, died Nov. 29 at Millbrook, N. Y., where he was visiting some friends.

Franz C. Schmelkes

Dr. Franz C. Schmelkes, 43, assistant director of research chemistry for Wallace & Tiernan Co., Inc., Belleville, N. J., died Dec. 11 at his home in Montclair.

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
MURIATE OF POTASH
62/63% K₂O, ALSO 50% K₂O
MANURE SALTS
22% K₂O MINIMUM
UNITED STATES POTASH COMPANY
INCORPORATED
30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

CHEMICAL SPECIALTY COMPANY NEWS

Fires That Need Never Happen

FIRES kindled by paper decorations, cloth upholstery and hangings in public places need never happen. Because of chemical research, flammable fabrics even to a sheer party frock can be rendered incapable of supporting fire by the simplest of treatment.

Only within the year, in fact, the Du Pont Company began commercial production of a new chemical known as ammonium sulfamate. This crystalline substance "flameproofs" so thoroughly that a blazing blow-torch merely scorches paper and cloth that has been properly sprayed or dipped in a solution and dried. Today it is produced in carload quantities, with the Army and Navy necessarily using most of it. Other suitable fire retardants introduced by Du Pont prior to the development of ammonium sulfamate are still available, the company said.

Neither ammonium sulfamate nor the other Du Pont retardants when incorporated in paper or cloth will give off harmful or toxic fumes upon being subjected to heat.

Glidden Co. Penalized By WPB

Stiff penalties have been imposed upon the Glidden Co., manufacturers of paints and vegetable oils, Cleveland, O., following major violations of two War Production Board orders.

Suspension Order S-162 states that the company, without the authorization required by Conservation Order L-41, began the construction of two buildings at its plant in Buena Park, Calif., for the storage of seeds and beans and for delinting cotton seed. The estimated cost of construction of each of these buildings was in excess of $5,000.

Other violations included the acceptance of more than $12,000 worth of delinting machinery, on a purchase order not in conformity with the requirements of General Limitation Order L-83. which restricts transactions in critical industrial machinery to "approved orders."

By the terms of the penalty order, Glidden is prohibited, during the coming year, from completing work on the two buildings illegally started. In addition, the company is ordered to make no use of any of the delinting machinery which it had acquired for installation in the buildings, except as may be specifically authorized by the Director General for Operations.

Arsenicals Should Be Plentiful

Cotton growers, farmers, and others producing food or other economic crops who rely heavily on arsenical insecticides for the production of these crops will in all probability be able to obtain an adequate supply of such insecticides during 1943.

"While it has been necessary to curtail sharply many normal uses of arsenic and to require substitution of less scarce materials in many directions, the basic requirements of agriculture for arsenical insecticides should be well provided for during 1943," said W. H. Moyer, in charge of insecticides and fungicides for the Chemicals Division of WPB.

In some cases, however, farmers probably will be urged to make greater use of items such as nicotine sulfate and cryolite, which are more plentiful than arsenicals.

In regard to rotenone and pyrethrum, both imported materials, the picture is not so bright. Supplies are decidedly limited, and substitution will be necessary wherever possible.

The greatest uncertainty in the arsenical situation results from the great variation in the demand for calcium arsenate in the cotton South. The infestations there of boll weevil and cotton leafworm vary greatly from year to year, although it is expected that sufficient reserve supplies of calcium arsenate and cryolite will be available to provide adequate protection for this crop.

The situation in regard to the insecticides was explained to representative manufacturers recently at the initial meeting of the Arsenical Insecticide Manufacturers Industry Advisory Committee by Mr. Moyer, who is the Government Presiding Officer of the Committee.

Robbins Buys Glover

George B. Robbins Disinfectant Co., Cambridge, Mass., has taken over Glover Products, a company engaged in the same line of business. Robbins will operate Glover as a separate unit for the time being and gradually bring it in as part of the parent company.

Gets Voting Control

Standard Oil Co. of California now holds 59.87% of the voting control of the California Spray Chemical Corp., Richmond, Calif.

Davis on Committee

H. C. Davis, California Spray Chemical Corp., has been made a member of the War Production Board's Arsenical Insecticides Manufacturers Industry Advisory Committee.

PCO Conferences Set

Two pest control conferences are scheduled for January. First is the seventh annual Pest Control Operators Conference at Purdue University, Lafayette, Ind., Jan. 4 to 8. Second is the third annual Eastern Pest Control Operators Conference at Massachusetts State College, Amherst, Mass., Jan. 11 to 13.

Purdue conference program has been outlined on the theme "Pest Control—Protection of Health at Home and Abroad." Those desiring accommodations should write to Prof. J. J. Davis, Purdue University.

The Amherst conference has been streamlined to meet the wartime situations.

Moisture Sets Offered

Tamms Silica Co., Chicago, Ill., makers of Dri-Air chemical powder has introduced two new units of non-essential materials. Either outfit is adequate for removing excess moisture from 1,000 to 1,200 cu. ft. of air, and provides protection for any place where excess moisture in the air is apt to cause damage.

Ontario Begins Operations

Manufacture of chemicals for the war department began recently at Ontario Specialties, Inc., Watertown, N. Y. Plant is operated by Globe Crayon Co., Brooklyn.

BOOKLETS & CATALOGS

Chemicals

A436. *Alkalis.* The role of alkalis in the manufacture of aluminum and other strategic materials is described in Da 4211, new 4-page leaflet. Diamond Alkali Co.

A437. *Glass.* Vol. 50, No. 5 of "Pittsburgh Plate Products" discusses the history and the present status of safety glass for automobiles, suggesting improvements in car design for greater safety. New developments in the production of fast-drying oils from domestic sources which will relieve our dependence upon imported materials are described in another article. Pittsburgh Plate Glass Company.

A438. *"Industrial Bulletin."* Aerobiology, the study of air-borne organisms, its classification as extramural and intramural, and the recognition and destruction of air-borne infection are summarized in this 4-page leaflet, No. 183. The increasing industrial importance of the selective activity of enzymes is also briefly reviewed. Arthur D. Little, Inc.

A439. *"Lead."* New and broader applications for lead which will release critical metals for military use are discussed in the latest issue of this periodical, Vol. 12, No. 6. Lead Industries Association

A440. *"Lucite" Aircraft Manual.* Methods of fabricating "Lucite" methyl methacrylate resin into airplane enclosures and other products are detailed in this new handy manual. The extensive resources and experience gained in the manufacture of "Lucite" are here available for further developing its properties and utilities.

Information on the care and handling, sawing, blanking and punching, drilling, threading and tapping, routing and shaping, sanding, scraping, finishing, cleaning, cementing, forming, mounting and installation, and repairing of "Lucite" is contained in the manual. Photographs, diagrams, tables, and graphs illustrate these various operations and the mechanical, thermal, optical, electrical and general properties of the plastic. Plastics Department, E. I. du Pont de Nemours & Co., Inc.

A441. *Nickel.* The current issue of "Nickelsworth" discusses ways to eliminate bottle-necks in the manufacture of accessory items, illustrates methods for repairing Monel binding and winding wires, and tabulates qualitative tests for identifying common white metals and alloys. The International Nickel Co., Inc.

A442. *Olive Oil.* The current issue of the "Olive Oil Bulletin," Vol. 3, No. 3, details its emblem regulations and discusses the impure olive oil situation. The Olive Oil Association of America, Inc

A443. *Plastics.* The relation of plastics to coal, preference order M-246 for phenolic resins, and the heat resistant, high impact Durez 55 compound are discussed in the latest issue of the "Durez Molder." Durez Plastics & Chemicals, Inc.

A444. *Silicate Products.* December "Silicate P's and Q's" lists the many products discussed in its leaflet pages during the past twelve months. Philadelphia Quartz Co

A445. *Steel.* The December issue of "Steel Facts" discusses the conservation of millions of pounds of aluminum and copper. Army ordnance engineers are specifying increasing numbers of iron and steel functional parts to pinch hit for those formerly made of non-ferrous metals. Another article reports five new alloy addition agents containing few critical materials which "pep up" the performance of certain of the lean alloy steels to equal other steels of much higher alloy content.

A446. *"Testing in Modern Industry"* is the new illustrated 106-page booklet describing the varied activities of the United States Testing Company, Inc. Includes fifty pages of standard scientific and industrial tables. U. S. Testing Co., Inc.

A447. *Tin-Bearing Metals.* The Tin Research Institute's publication No. 111 records a comprehensive study of the factors governing the adhesion of tin-base bearing alloys to various backing metals, including steel, bronze, copper, brass, and cast iron. Reporting the results of thousands of individual tests, this investigation shows the effects of variations in alloy composition, mould design, temperature of metal and mould, and rate and direction of cooling, in relation to hand pouring, die-casting, and centrifugal methods of production. Illustrated with technical drawings, graphs, and tables. The Tin Research Institute.

A448. *Water Treatment.* The chemistry of cation exchange by hydrogen zeolite and the mechanical equipment employed in this softening treatment are described in the latest issue of "The Betz Indicator," Vol. 11, No. 11. W. H. & L. D. Betz.

A449. *"Wood Preserving News,"* current issue, discusses the applications of creosoted pile foundations, wood stave pipes, railroad ties, and chromated zinc chloride treated ties. Vol. XX, No. 11. Service Bureau, American Wood-Preservers' Association.

Equipment — Containers

E781. *Asbestos Clothing.* Folder illustrates a safety asbestos outfit. Safety Clothing and Equipment Company.

E782. *Barrels, Wooden.* As a solution to the problem of conserving vital packaging material, this instructive booklet presents authoritative information concerning the manufacture and the practical use of wooden barrels and kegs. Of special interest are the pictorial tour of a cooperage plant, the step-by-step photographs showing how to handle wooden barrels, and the charts permitting the quick selection and specification of the type of barrel or keg most satisfactory for

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E783. *Cranes.* Vol. 1, No. 3 of the illustrated "Graphic" describes giant cranes, bulldozers, Steelweld presses, and tramrails. The Cleveland Crane and Engineering Co.

E784. *Graphite Lubrication Handbook* for the lubrication engineer discusses the work of colloidal graphite and contains an indexed list of applications for the various concentrates of the lubricant. Nassau Laboratories.

E785. *Heavy Machinery.* New 24-page illustrated booklet surveys the varied products of Whiting Corporation, including cranes, railroad and aviation equipment, cupolas and foundry equipment, Quickwork products, Swenson evaporators and filters, and other special heavy equipment. Book No. 236. Whiting Corporation.

E786. *Instruments.* Bulletin Z-6100 describes and illustrates unit construction of temperature controllers, the "electronic principle" for obtaining control without contact between measuring and control functions of the instrument, remote controllers, combustion safeguard equipment, and other instruments. Wheelco Instruments Co.

E787. *Manganese Steel Products.* Manganese steel sheaves, rollers, rifles, gears, and renewable lip dippers are described and illustrated in the current issue of "The Amsco Bulletin." American Manganese Steel Division, The American Brake Shoe & Foundry Co.

E788. *Motor Fitness.* Primarily intended for plants converted to war production, Bulletin GEA-1017 discusses how to get the most service out of old and new motors, "switching" motors from one job to another, and equipping old machines with new motors. Also included are technical data on selection and application of motors, various types of motor enclosures, secondary ratings of standard integral-hp. motors, ways to determine WR^2, motor maintenance, full load currents of motors, selection of a-c control, and the use of the hook-on voltammeter. Illustrated and arranged for quick reference. General Electric Company.

E789. *Oil Burner, Proportioning.* Complete with diagrams for automatic control hookups and installation pictures, this 16-page catalog No. 407, gives information on the proportioning oil burner. Hauck Manufacturing Company

E790. *"Pioneer, The"* describes and illustrates a sewage sludge sampler, floor resurfacer, multi-point pH recorder, rubber tire preserver, and electronic paper thickness tester in its current issue. Niagara Alkali Company.

E791. *Plastics.* Briefly reviewing the steps in the manufacture of resin-bonded plywood, Vol. 7, No. 9 of "Plastics News" also discusses plastic collars and fluorescent light tube sockets. Durez Plastics & Chemicals, Inc,

E792. *Power Transformers* for Mercury-Arc Rectifiers. Bulletin GEA-3883 describes and illustrates the interior and exterior construction details and the operation of two typical mercury-arc rectifier transformers. General Electric Company

E793. *Pumps.* The dimensions and other characteristics of SCV pumps are tabulated in Catalog D2-1042. Illustrated with photographs and diagrams. Economy Pumps, Inc.

E794. *Pumps, Sanitary.* Bulletin 115 illustrates and describes sanitary pumps. Blackmer Pump Company.

E795. *Ramix Bottom* for Basic Open Hearth Furnaces. Bulletin 210R describes and illustrates this refractory material. Basic Refractories, Inc.

E796. *"Rectifiers, Ignitron Mercury-arc* in the Steel Industry." The characteristics and applications of ignitron mercury-arc rectifiers in meeting the conversion-equipment problems in the steel industry are outlined in the 28-page bulletin, GEA-3827. Also discussed are d-c power supply, d-c systems, 250-volt distribution systems, 600-volt continuous mill systems, and reversing mill systems. Technical graphs and schematic diagrams illustrate the principles of ignitron rectifiers. General Electric Company.

E797. *Shovel, Dragline, Crane.* Catalog No. 1943 lists the construction details, installation views, general dimensions, clearances, lifting capacities, and specifications, for the 1¼ yd. heavy-duty model LS-120 crawler shovel, crane, dragline. Link-Belt Speeder Corporation.

E798. *Steam Hose, Maintenance.* Now that rubber is so scarce, the revised catalog section on steam hose which contains simple rules for the care and maintenance of this rubber hose and detailed instructions on the proper methods to attach couplings is of immediate, practical value. The B. F. Goodrich Company

E799. *"Texrope Topics,"* informally describes and illustrates various applications of Texrope V belt drive. Allis-Chalmers.

E800. *Welding.* Physical properties, procedure, and advantages of rebuilding worn surfaces on machine parts with low temperature welding are outlined in Bulletin No. 185. Eutectic Welding Alloys Co.

E801. *Welding Accessories.* This new illustrated bulletin, GEA-2704B, catalogues many arc-welding accessories in its 32 pages. General Electric Company.

E802. *Welding* a-c and d-c are compared in the new 12-page booklet. A-c welders increase output because of the absence of magnetic arc blow, ease in using heavy electrodes with higher currents, and ability to make good welds in all positions. Welders with current ratings from 100 to 500 amperes are described and illustrated in pamphlet B-3136 which features welders for heavy-duty work. Westinghouse Electric and Manufacturing Company.

E803. *Wet Process Porcelain Products* for handling chemicals and acids are described in this attractively illustrated Catalog C-1. Careful design and accuracy are fundamental in the manufacture of the pipes, fittings, Y-type and angle valves, flanges, spacers and raschig rings. To insure correct specifications when ordering, photographs, diagrams, and tables of exact dimensions are included. Illinois Electric Porcelain Company.

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THE LABORATORY NOTEBOOK

Recording Photoelectric Spectrophotometer

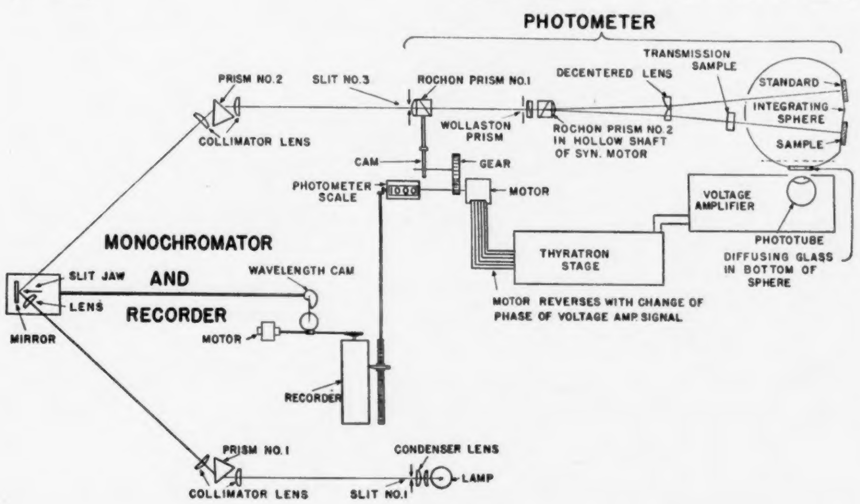
The recording photoelectric spectrophotometer was developed by General Electric from a design by Professor A. C. Hardy of M.I.T. It records spectral-reflectance or spectral-transmission measurements. Reflectance values are expressed as a percentage of the selected standard. Transmission is expressed either directly or as a percentage of a standard transmission sample.

The principle of operation is illustrated in the schematic diagram. The collimator lenses and prism No. 1 produce a spectral image of slit No. 1 in a vertical plane normal to the mirror at the second slit. A portion of this spectrum is imaged by collimator lenses and prism No. 2 on slit No. 3.

Monochromatic light from slit No. 3 is plane-polarized by Rochon prism No. 1. The Wollaston prism generates two components, mutually perpendicularly polarized, which fall on standard and sample respectively. Rochon prism No. 1 is mounted in a bearing, and is rotated by a cam arrangement. The angular position of this Rochon prism with respect to the Wollaston prism determines the ratio of the energy distribution in the two beams, and is therefore a measure of the reflectance of the sample in terms of the standard.

Rochon prism No. 2 is mounted in the hollow shaft of a synchronous motor. The rotation of this element serves to vary the light intensity of the incident beams from minimum to maximum on the sample and the standard, out of phase with each other. A phototube views a frosted glass in the integrating-sphere wall, the brightness of which is a function of the sum of the product of beam intensity and reflectance for both sample and standard. When the light reflected from the sample is not equal to that reflected from the standard, an alternating-current component is present in the phototube current. The phase of this alternating component with respect to the voltage applied to the synchronous motor determines which of the two reflected beams is the more intense.

This amplified alternating component is then used to control, by means of the thyraton stage, the direction of rotation of the balance motor. This motor adjusts the Rochon prism No. 1 to obtain a redistribution of energy in the sample and the standard beam, thus removing the alternating component in the phototube current. The angular position of Rochon prism No. 1 is then a measure of the reflectance of the sample in terms of the standard. The illumination on the sample and the standard is normal to the surfaces, and covers a portion one inch in diameter. The frosted glass in the integrating-sphere wall is symmetrically located with respect to the sample and the standard position.



Transmission measurements are made by using a reflection sample and a standard of the same material, and introducing the transmission specimen into the incident sample beam. This method of operation eliminates from the measurement the characteristic of the source and of the spectral-response of the phototube.

Manufacturers of dyes, inks, pigments and any other product in which color is one of the controlling factors of good quality will find the recording photoelectric spectrophotometer valuable in the standardization and control of manufacturing processes for it furnishes an accurate and permanent graphic analysis of any color.

INDUSTRY'S BOOKSHELF

Mark, H. Physical chemistry of high polymeric systems. Translated by K. Sinclair and revised by J. Edmund Woods. New York: Interscience Publishers, Inc., 1940. x, 345 p., diagrs., tables. $6.50. Reviewed by T. E. R. Singer.

During the last few years the chemistry of the high polymers has passed through an important phase of development and has become an independent, rapidly expanding branch of chemical science. Its increasing technical importance and the close relation to the biological sciences justifies a comprehensive treatment of the whole sphere of high polymer chemistry. Ten years ago interest centered in the structural principle governing the high polymers, the forces of cohesion of the large molecules and the paths leading from the chemistry of the low molecular substances to the high polymers. Apart, however, from the theoretical considerations, the rapidly increasing mass of data demands a comprehensive, systematic description of the substances available and studied. In this, emphasis mainly falls on the material properties of the individual representatives and on their mutual relationships. It is hardly possible at present to discuss fundamental questions of structure but the time has arrived to present the relation between structure and properties in all its details. Material facts which can almost be termed excessive need to be sifted and ar-

(Continued on page 909)

CANADIAN REVIEW

By Kenneth R. Wilson

OTTAWA—Prophetic of what may be expected to happen sooner or later in the United States, was the recent order by Canada's Price Ceiling Czar, Donald Gordon, which "froze" all business in this country "for the duration."

Under the new order which became effective November 2, the creation of new business outlets, the stocking of new lines of goods not already handled and removal to larger premises were placed under strict control. The order applies to all manufacturers, wholesalers and retailers and to ten specified types of services. It also prohibits any firm from extending its operations into any other classification.

K. R. Wilson

Behind this drastic new control measure lies the need for conserving materials and releasing manpower for war industry and the armed forces. As outlined last month, Price Czar Donald Gordon has recently been given the added responsibility for putting Canadians on "iron rations" for the duration of the war. It is his new job to see that provision of goods and services for civilian use is systematically reduced to the bare minimum required for "health, efficiency and morale."

It was thought inconsistent with such a program that any manufacturer or distributor whose business was curtailed, should be permitted to "switch" to some other line of trade or production. Were no curb placed on business expansion and transfers a jeweller who found himself without merchandise to sell, might decide to start into the women's clothing field. In so doing he might merely make it more difficult for those already in that field to maintain volume and profits in face of a declining supply of merchandise.

Thus the new order is deemed essential (1) to maintain greater stability for those already engaged in trade and industry; (2) to maintain fair distribution of available goods to those businesses already serving the public. There are very few exemptions to the new freezing order. The one notable exemption is the sale of newspapers, magazines or periodicals.

In addition to the new freezing order, Donald Gordon has also issued a preliminary statement of policy to indicate more precisely what this curtailment program means to business operations in Canada. Of special interest and importance is the stress laid on the fact that the program will be "orderly and progressive" and that there will be no wholesale reduction or curtailment of civilian industry unless or until manpower machinery is ready and prepared to absorb or channel the workers so released, directly into war industry.

In this regard the different way in which the gold mining industry has been handled in Canada and in the United States is highly significant. The United States order decreed that all gold-producing mines should be closed down as of a certain date (barring subsequent appeal for exemption). The Canadian policy has been to draw up detailed blueprint of the manpower in the industry and transfer men from the mines in accordance with that blueprint, if as and when that manpower can be effectively absorbed into war industry.

On the basis of recent experience, Canada feels that unless great care is exercised there will be a considerable wastage of manpower by summary closure as in the United States. Right now, every civilian and non-essential trade and service in Canada is busy preparing blueprints for release of manpower against the day when the call comes. In most cases it is expected that the switchover will be "orderly and progressive," and that the whole program will take much longer and will be carried out much more slowly than was expected a few weeks ago.

It just does not seem possible to work quickly in a program of this type if colossal and calamitous wastage of manpower is to be avoided.

There has been a lot of interest here in the recent announcement from Secretary Henry Morgenthau that a new three-point program would be inaugurated in the United States at the end of November. First aim of the program is reported as being a huge nationwide borrowing plan "taken to the people by a vast volunteer army of financiers, advertising men and salesmen, spear-headed by a small group of paid workers and administrators."

That is the sort of program which Canada has operated now for more than a year and a half. Only a few weeks ago Canadians put over their third nationwide Victory Loan campaign. It was participated in by nearly two million individual subscribers. The government asked for a minimum subscription of $750 millions and obtained at least $975 millions (final figures will not be available until some time in December).

Apart from the obvious purpose of raising money to help pay the cost of war, Canada looks on these campaigns as doing two very vital things:

1. The stimulation of national and industrial morale.

2. The giving of invaluable support to price, wage and other wartime control measures.

In this last Victory Loan campaign in Canada, special labor-management committees were set up in every key plant, factory and business institution across the country. In many cases the employees handled the entire campaign themselves. They organized their own mass meeting, handled their own canvassing arrangements etc. (one big talking point was the fact that these bonds can be purchased on a payroll deduction plan. For every $100 bond the employer deducts about $17 a month over the next six months. Average subscription under this payroll plan is expected to run about $90 for each worker. It is expected that nearly a million of Canada's three million urban workers will have subscribed when final returns are available.)

Looking back over the results of the three-week campaign, there is country-wide enthusiasm for what has been achieved in bringing labor and management closer together and in giving a tremendous "lift" to productive effort and national and community morale. Said one typical employer:

"The whole thing has had an amazingly favorable effect on the morale in the plant. We feel that it is well worthwhile entirely aside from the loan."

The other important result of these periodic "blitz bond-selling campaigns is to give very considerable aid to the operation of the price and wage ceiling and to the government's anti-inflation program."

Obviously price control implies far more than the mere regulation of prices. It is not enough or even possible to control the price level unless stern measures are taken to syphon off the excess buying power created by war purchasing, and which must inevitably compete for a decreasing amount of consumer goods and services. That is where Canada's unique and highly successful Victory Loan campaigns come into the picture.

In the last two Victory Loan drives (one in February, 1942, and the other one in November, 1942) Canada has obtained in individual subscriptions no less than $750 to $800 millions. On the basis of proportionate national wealth and income, this would mean in the United States a public subscription by the man-in-the-street of between $11 and $12 billions.

(Continued on page 908)

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

THERE'S no doubt about it, civilian goods which use chemical raw materials are going to get another kick in the shins from war production in 1943. One change in the program indicates that we are going to make more munitions for an offensive war and fewer weapons for defense. This will have a tremendous effect on chemical needs.

The shipbuilding program, too, calls for twice as many ships as we launched this year. That means more paints and plastic plywood. In addition, the whole war program is going to require more chemicals than this country has ever produced. From all indications, the chemical industry will meet the demand . . . but it will be at the expense of civilian production.

Here's about what you can expect for 1943:

Paints, because of the linseed oil scarcity, will not be as easy to get. Cellophane will be rationed still further as more glycerine goes to the explosives industry. Vegetable oils will go to feed the United Nations. Supply of wood pulp will be low because of the labor situation. Cellulose supplies will go for lend-lease, explosives, plastics and rayon only.

Nitrates, strangely enough, should be more abundant than expected.

Worst problem for the chemical producers will be to keep up with the growing demand for phenol.

Phenol is becoming increasingly scarce, first because it is used in making explosives and, secondly, because it is the principal ingredient in one of the main types of synthetic finishes and in the plastic glue used in making modern plywood. The uses of plywood as now improved under the skilled hand of the chemist have expanded considerably. Modern plywood is as strong as steel for many uses, is not harmed by water or weather, is more easily worked, and can now be made fireproof. Its use in shipbuilding is growing fast and if the Army should decide on a large plastic plane program the scarcity of phenol could be acute.

New phenol plants are being built to add about 75% to capacity but scarcity of materials has slowed up construction. About half the phenol now made is going into resins for glues and paints.

In the substitute field we badly need from synthetic processes replacements for the vegetable oils formerly imported like tung, coconut, etc.

On the encouraging side there is evidence of abundant supplies of sulfuric acid, alkalis and soda ash. Production of oxygen is at enormous levels. The U. S. today can be said to be the most self-contained chemical producer in the world. The industry's planned program, started in 1939, is the reason for this.

Government in the past month made many moves which affect the chemical industry. Among the more momentous ones are: a committee composed of leading research and development men of the chemical and allied industries is being formed to serve as liaison between their companies and the referee board of the chemicals division, WPB. All acrylic resins and acrylic monomer have been put under rigid allocation and use control. Six big manufacturers of glycerine agreed to reduce their price one cent a pound through a voluntary agreement with OPA. Lend-lease needs have cut the amount of oils available for manufacture of soap. Controlled materials plan went into effect specifically allocating steel, copper and aluminum. (Other materials may follow.) Sulfuric acid, including oleum and spent acid, is under allocation control. Crisis in tank car transportation is being studied by chemical traffic executives in Washington. Additional December allocations of chemicals to civilian industry included copper chemicals, furnace type carbon black, phenolic resins and para phenyl phenol resins.

All manufacturers requiring critical chemicals for war production will be assisted by the Materials Redistribution Branch, WPB, in locating such stocks in the New York-Northern New Jersey area, H. M. Brundage, Regional Deputy Director, WPB, in charge of priorities and materials, has announced.

Under Priorities Regulation No. 13, the availability of idle, excess, and frozen stocks of chemicals has been recorded by the Materials Redistribution Branch, based on reports as to location, quantity, and specifications, submitted by chemical suppliers and users. The Branch is expediting the movement of critical chemicals from idle inventories into the vital production of war materials.

The sixth material substitution and supply list, recently released by the Conservation Division, WPB, indicates some 47 chemicals, the supply of which is inadequate for war and essential civilian uses. In some cases the supply is not sufficient for war purposes alone. Many of these materials will probably become even scarcer, necessitating conservation and substitution, so that war purposes may be served.

The work of the Branch depends on the cooperation of holders of stocks of critical chemicals in reporting them promptly. Details of specifications, quantities, and location of stocks of all chemicals listed in Schedule A to Priorities Regulation No. 13 should be transmitted by letter immediately to the Materials Redistribution Branch, WPB, 122 East 42 Street, N. Y. City.

Heavy Chemicals: A more flexible method for the restriction of chlorine consumption was establshed this month when the War Production Board issued a completely revised version of General Preference Order M-19, relying entirely on the monthly allocation of the chemical and eliminating the conservation provisions which had been left in effect when allocation first was introduced.

Under these provisions, the use of chlorine for certain purposes and in certain industries was limited to various fixed percentages of consumption during a base period. This control is said to have been too rigid when chlorine was in easy supply and not tight enough when it was scarce.

Consumers, on the other hand, were fairly certain that allocations which have been made in recent months, would be large enough to give them all the chlorine they were allowed to use under the conservation provisions. This certainty now will disappear as all allocations are to be adjusted from month to month to the actual supply and demand of the chemical.

Fine Chemicals: Those who rely heavily on arsenical insecticides for the production of these crops will in all probability be able to obtain an adequate supply of such insecticides during 1943. "While it has been necessary to curtail sharply many normal uses of arsenic and to require substitution of less scarce materials in many directions, the basic requirements of agriculture for arsenical insecticides should be well provided for during 1943," said W. H. Moyer, in charge of insecticides and fungicides for the Chemicals Division of WPB.

In some cases, however, farmers probably will be urged to make greater use of items such as nicotine sulfate and

cryolite, which are more plentiful than arsenicals. In regard to rotenone and pyrethrum, both imported materials, the picture is not so bright. Supplies are decidedly limited, and substitution will be necessary wherever possible. The greatest uncertainty in the arsenical situation results from the great variation in the demand for calcium arsenate in the cotton South. The infestations there of boll weevil and cotton leafworm vary greatly from year to year, although it is expected that sufficient reserve supplies of calcium arsenate and cryolite will be available to provide adequate protection for this crop.

A government program for the purchase and importation of rotenone from Brazil and Peru to be carried out by Commodity Credit Corporation has been announced jointly by the U. S. Department of Agriculture and the Board of Economic Warfare. Officials hope to import at least 4½ million pounds of the insecticide during the next 12 months to help make up for the reduction in imports resulting from Japanese invasion of Singapore and to facilitate increased truck crop and livestock production. Rotenone is an insecticide needed in combatting ticks, weevils, aphids and other truck and livestock pests.

Under the plan, the Commodity Credit Corporation is the exclusive purchaser of all rotenone-bearing roots (unground or powdered) having a rotenone content of not less than 3 per cent. Prices paid are 16½ cents per pound f.o.b. Iquitos, Peru, and 17 cents per pound, North Brazil Ports for rotenone-bearing roots containing not less than 5 per cent crude rotenone, and not more than 12 per cent moisture on arrival, and 21 to 21½ cents per pound respectively for powder of not less than 5 per cent crude rotenone. Adjustments are specified for roots or powder of lower or higher crude rotenone content.

Purchases will be made through existing commercial companies acting as agents for the CCC, so as not to disturb normal business channels.

Fertilizer Materials: Development of chemical manufacture of nitrogen products through the synthesis of ammonia has relieved the United States of dependency upon shipping for the supply of this vital material, and has also released vessels for the transportation of other critical military materials.

The only limiting factor upon the supply of nitrogen for explosives in the United States is the facilities for its manufacture since nitrogen is present in the air in inexhaustible supply to the extent of 34,500 tons above every acre of ground.

An official recommendation has been made by the WPB to the Office of Defense Transportation that the minimum carload for manufactured fertilizers in bags under General Order ODT 13 be made 60,000 pounds. There may be a shortage of fertilizers in the spring of 1943. The elements of supply and demand operate to produce a shortage.

Prepare to cope with a shortage as great or even greater than we face for 1942-43. Agronomists in every state should follow as closely as possible fertilizer usage this year and be prepared to recommend such changes as may be necessary to meet plant-food shortages, and secure more efficient utilization of available fertilizer supplies.

It is probable that some revision of fertilizer grades will be needed before another season. If so, state agronomists, within the limits imposed by national objectives, will be expected to select the grades. More uniformity within regions is desirable and several states should further reduce the number of grades to be offered for sale.

Some changes produced by war should be retained in the post-war period. Fertilizer grade limitation is one of those changes. Steps should be taken in many states to include a provision in the fertilizer control law or regulations that will make possible a reasonable limitation of grades of fertilizer to be offered for sale.

Where such provisions are in effect, fertilizer grade selection is usually made by the agricultural college and the state fertilizer control officers in consultation with representatives of the fertilizer industry.

The advent of war has shown how essential it is to have dependable statistics on plant-food consumption. State fertilizer grade tonnage reports are one of the most valuable sources for such data. Such reports, however, are not available for Delaware, Georgia, New Hampshire, Oregon, Tennessee, Virginia and Washington. Agronomists and the fertilizer control officials of those states would render their state and the nation a useful service if arrangements were made to secure such reports for 1942 and subsequent years.

The post-war period will present agronomists with the reverse of our war nitrogen problem. Under the impetus of war the country's capacity for producing synthetic ammonia is being vastly increased. Our total capacity will be more than twice as great as our maximum prewar consumption of nitrogen for all purposes. There will be synthetic ammonia plants in ten or more states. It is expected that the farm price of nitrogen will be substantially lower than in recent years. The problem of the utilization of this nitrogen is to be studied by a National Joint Committee on Nitrogen Utilization. Members of this society will have an important place in the work of that committee.

Similar but less acute problems may face us with respect to the utilization of increased supplies of phosphoric acid and potash. Agronomists should lead in their effective utilization. The demands for research and leadership in the post-war years may well be as great or greater than in the war period.

A grade-substitution program expected to reduce consumption of chemical nitrogen in mixed fertilizers by approximately 20 per cent was instituted this month by the Director General for Operations through issuance of General Preference Order M-231 as amended. Through this program a large amount of nitrogen, vital for war purposes, will be saved without impairing crop production in more than a negligible degree, WPB said.

Schedule B of the amended order lists the grades of fertilizer, by nitrogen content, used during the 1940-41 season in the respective states Opposite these are the approved grades, which are to be substituted in 1942-43. Fertilizer manufacturers are required to produce the approved 1942-43 grades in the same proportion as 1940-41 grades.

The amended order also placed manufacturers on the same basis as dealers and agents in respect to stocks on hand. That is, manufacturers may now deliver stocks of fertilizer packaged in lots of less than 80 pounds. Previously they were required to reprocess these stocks into approved grades and repack them in 100-pound bags.

The order now also permits the sale, delivery and use of stocks of unapproved grades located in warehouses more than 50 miles from the manufacturer's nearest plant. This provision will make these stocks available for use on crops without the necessity of transporting them back to the mixing plants for reprocessing into approved grades.

Manufacturers of fertilizer in pressed tablet form and for use in hydroponics are permitted to use up the stocks of chemical nitrogen they had on hand on September 12, 1942, effective date of the original order.

Use of chemical fertilizer containing chemical nitrogen on melon and cucumber crops is prohibited on the grounds that chemical nitrogen is needed for crops more essential to the war effort. Use of mixed chemical fertilizer containing chemical nitrogen during the spring of 1943 on small grain to be harvested for grains also is banned.

Natural Raw Materials: Turpentine demands from producers were growing this month and many tank cars were sold. The government is giving inquiries for large quantities in glass containers. An advance in the parity price of gum naval stores early this month brought the parity up to $90.26 per unit of one barrel spirits turpentine and 1,400 pounds rosin. Flow of gum turpentine and gum rosin into government stockpiles continues at a heavy rate for this season. Gum naval stores will share in the 1943 loan program which is available to the basic agricultural commodities. Starting Dec. 1, a 3% transportation tax was placed on all freight charges, subjecting all naval stores, except to Canada and for export, to this addition. Labor situation in the naval stores industry grows steadily worse. The weather has affected production, too, in recent weeks.

WPB Personnel

The following revised list of executive personnel of the War Production Board—incomplete in some divisions and offices in which organization has not been fully set up—is made available for informational purposes:

(Building Code: Census—Census Bldg.; IA—Indiana Ave.; JS—Jefferson School (Sixth and D, S.W.); LLB—Lend-Lease Bldg.; NPOB—New Post Office Bldg.; RH—Raleigh Hotel; RRB—Railroad Retirement Bldg.; SSB—Social Security Bldg.; MCB—Municipal Center Building; TE—Temporary "E"; TR—Temporary "R"; TS—Temporary "S"; WGLB—Washington Gas Light Bldg.; Empire St.—Empire State Bldg., New York. The number before the Building Code is the room number. The number after the dash is the telephone extension of the Washington, D. C., telephone number, Republic 7500.)

Executive Office of the Chairman

Chairman, Donald M. Nelson, 5055 SSB—2113.
Vice Chairman, W. L. Batt, 5055 SSB—2212.
Vice Chairman, J. S. Knowlson, 5075 SSB—71211.
Vice Chairman, C.E.Wilson, 5037 SSB—2134

Assistants to the Chairman
Sidney J. Weinberg, 5403 SSB—2193.
A. C. C. Hill, Jr., 5036 SSB—3384.
E. A. Locke, Jr., 5036 SSB—2585.

Special Assistants to the Chairman
Morris Creditor, 5055 SSB—72883.
F. G. McClintock, 5055 SSB—2107.
L. R. Boulware, 5062 SSB—2216.

Office of Executive Secretary
Ex. Sec., G. Lyle Belsley, 5518 SSB—2233.
Asst. Ex. Sec., Frederick Roe, 5518 SSB—2223.

Planning Committee
Chairman, R. R. Nathan, 5716 SSB—2505.
Ex. Director, Edward T. Dickinson, 3406 SSB—3357.
Administrative Officer, Carroll K. Shaw, 3028 SSB—71278.

Office of Organizational Planning
Director, Dr. Luther Gulick, 3719 SSB—2117.
Asst. Director, L. S. Fish, 3715 SSB—2118

War Production Drive Headquarters
Director, W. G. Marshall, 1206 RH—4369.

Office of Rubber Director

Director, William M. Jeffers, 5027 SSB—3256.

Combined Production and Resources Board

Deputy Chairman-U.S., J. S. Knowlson, 5075 SSB—71211.
U. S. Sec., J. P. Gregg, 5611 SSB—73161.
Asst. U. S. Sec., S. L. Phraner, 5737 SSB—74928.

Smaller War Plants Division

Director, Lou E. Holland, 1110 RH—73085.

Procurement Policy Division

Director, Houlder Hudgins, 4514 SSB—2251.
Deputy Director, Tudor Bowen, 4514 SSB—2251.
Deputy Director, Stanley F. Teele, 4520 SSB—3329.
Deputy Director, James M. Knox, 7080 TPB—Proc. 691.
Exec. Officer, C. Irving Hansen, H-283, TE—5913.
Office of Commodity Purchase Advisors, Chief, C. Irving Hansen, H-283 TE—5913.
Contract Review Branch, Chief, Carman G. Blough, 8-211 TE—2859.
Accounting Advisory Branch, Chief, Moore C. McIntosh, 8-217 TE—3443.

Statistics Division

Director, Stacy May, 5700 SSB—2410.
Assoc. Director, Simon Kuznets, 5713 SSB—71250.
Administrative Assist., R. Gordon Arneson, 5700 SSB—2410.
Contracts Branch, Chief, Emerson Ross, 2710 SSB—2431.
Industry and Facilities Branch, Chief, Dr. Vergil D. Reed, 2717 SSB—6436.
Materials Branch, Acting Chief, R. H. Denton, 2741 SSB—2783.
Munitions Branch, Chief, Morris A. Copeland, 2751 SSB—3542.
Office of Survey Standards, Chief, Howard C. Grieves, 2707 SSB—2492.

Division of Information

Director, Stephen E. Fitzgerald, 5525-A SSB—5242.
Assoc. Director, Bruce Catton, 5525-B SSB 5244.
Asst. Director, Charles E. Noyes, 5525-C SSB—6259.
Administrative Officer, Pearl Morris, 5525 SSB—5279.
Policy Branch, Chief, Bruce Catton, 5525-B SSB—5244.
Operations Branch, Chief, Charles E. Noyes, 5525-C SSB—6259.
Campaigns and Media Branch, Chief, Robert R. Ferry, 5640 SSB—4310.
Program Progress Branch, Chief, Barrow Lyons, 5166 SSB—5291.
Special Projects Branch, Chief, Martin Quigley, 5166 SSB—6611.

(*To Be Continued*)

Between The Lines
(*continued from page 847*)

crease in demand to much higher volume, it is not expected that any difficulty will develop.

Summing up, the problem in war regarding plastics is about equally balanced between inadequate production facilities, under present conditions, and insufficient raw materials entering such production. While a number of important plant expansions have been provided for in the past year, increasing pressure for raw materials for immediate war production, increasing demands for other materials, labor, etc., make it necessary to write off prospects from this source in future considerations. A case of combined factors is that of polyvinyl alcohol and polyvinyl acetate, where production facilities are adequate, but the supply of vinyl acetate monomer is not, the latter being used first to maintain full production of chloride-acetate co-polymer, polyvinyl formal and polyvinyl butyral, the remainder going into polyvinyl alcohol and polyvinyl acetate. The shortage of vinyl acetate monomer is due to insufficient plant capacity, rather than raw materials.

The supply of cellulose acetate butyrate plastic is measured in terms of production of cellulose butyrate flake. While there have been shortages in a given period, due to military demands overtopping those of civilian users, it was found possible to increase the output by plant re-arrangement, or as a result of smaller civilian supplies of molded parts which released larger quantities for other use. However, during the coming year the demand is again expected to exceed the supply.

Polystyrene has come into important war uses, due to its various properties, so that while it is expected that important war needs can be met, supplies for other purposes have been short, and these other needs will be cut out completely later on, according to present indications.

The wide range of materials entering plastics production, and the inter-relation of these materials in some cases, to other uses, all combine to create a problem for war control that refuses to remain static; it is a continuing proposition, for the industry and for the authorities concerned with the current situation.

The Kilgore Bill
(*continued from page 852*)

estate, equipment, facilities, machinery, materials or supplies, as it may deem desirable for the construction and equipping of such laboratories, semiworks plants, and pilot plants, to be operated under the direction of the Corporation, as it may consider necessary and desirable; (3) to patent such new processes, products, and developments as may be discovered or developed in the laboratories, semiworks plants, or pilot plants financed or operated by the Corporation, or developed or discovered by any employee of the Corporation; (4) to lease such patents on such terms and with such conditions as the Corporation shall deem desirable and consistent with the purposes of this Act.

Periodic Reports to the President

Sec. 10. The Director shall file a report on the operations of the Office and the Corporation under this Act every sixty days, to the President, the Vice President, and the Speaker of the House of Representatives. Such report shall briefly describe all projects initiated and completed since the previous report; and summarize progress on outstanding activities; it shall summarize progress achieved and problems encountered in the dissemination and application of new and improved techniques, materials, and products; it shall also include any comments and recommendations which the Director shall deem appropriate in order to further the purposes of this Act. The Office shall publish the Director's periodic report excluding, however, from this published report all material which, in the opinion of the Director, might give aid or comfort to the enemy.

Canadian Review
(*continued from page 902*)

Here then is an entirely new conception of the part which bond sales can play in helping to fight modern economic warfare. This money comes not from so-called "special names" (corporations, banks, insurance companies and other institutional buyers), but entirely from the wage-earner, the farmer, the merchant, the private investor. It is money which is being syphoned off directly from the stream of war purchasing power and thus making it easier for this country to keep those inflationary forces under control.

This program is the more remarkable when it is remembered that quite apart from voluntary loan subscriptions, Canadians are being required to meet no less than 52 per cent of this year's federal budget out of taxes and other revenue. (The corresponding figure in the United States is only 20 per cent and in Britain, 45 per cent). Incidentally, there is not a dollar of "bank" money in the total of almost $2 billions of Victory bonds which Canadians have purchased in the past 10 months. Between 35 and 40 per cent has come directly from the individual investor and the balance largely from corporate investors or life insurance company investment funds.

Washington
(*continued from page 812*)

Another development with possibilities for the industry is the accelerated tendency toward standardization of products for civilian consumption, with substitution of grade labeling, in place of brands, and a strong movement for simplification of products intended to make the most of limited materials and labor supply.

Still another matter of broad industrial interest is the handling of the manpower situation which can be expected to undergo marked change in both method and policy in the coming period.

SOCMA MEETS

August Merz, Calco chemical division, American Cyanamid Co., was reelected president of the Synthetic Organic Chemical Manufacturers' Association for 1943 at the annual meeting of the group held at the Chemists Club.

The association enlarged its board of governors by adding three new members, M. J. Hartung, president of the Maywood Chemical Co., H. L. Simons of H. L. Simons & Co., Inc., and Eric Kunz of Givaudau Delawanna, Inc. The members reelected as governors E. H. Killheffer of the E. I. du Pont de Nemours & Co., Wilmington, and F. G. Zinsser of F. G. Zinsser & Co. All of the foregoing, together with the association's officers, constitute the board of governors of the S. O. C. M. A.

C. M. Richter of the Pharms Chemical Co. was reelected first vice president, Victor Williams of the Monsanto Chemical Co. second vice president, Ralph Dorland of the Dow Chemical Co. again was named the association's treasurer, and Charles A. Mace of New York remains as secretary.

ADVERTISEMENT—*This entire page is a paid advertisement.*

Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

December ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Improved Synthetic Camphor Yield Seen With New Procedure

Ethanol Treatment of Bornyl Chloride Residues May Be Key

WEEKS, La.—What may be the key to higher yields of synthetic camphor is suggested in a recent patent granted to two inventors here.

The patent deals with a new technique for increasing the yield of bornyl chloride, and since this compound is an important intermediate in the production of synthetic camphor, the process described may be expected to have beneficial results in increasing the output of the latter material also.

Preparation of Bornyl Chloride

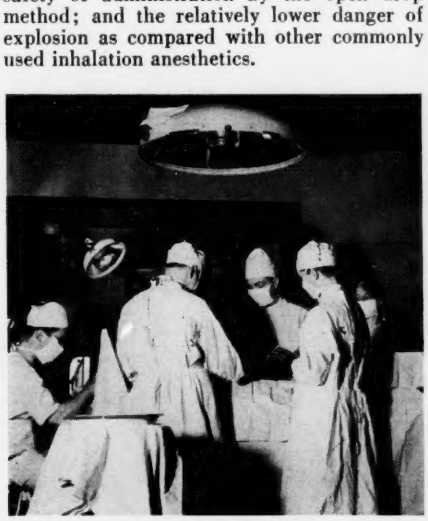
Bornyl chloride, the inventors point out, is prepared by saturating pinene with dry hydrogen chloride. An oily mixture is formed, from which the bornyl chloride is separated by crystallization. It has now been found, however, that substantial amounts of the bornyl chloride are not removed by the crystallization, and remain in the residue.

This additional material, the inventors claim, can be recovered by selective dehydro-

(*Continued on next page*)

Ether Called Best Wartime Anesthetic Of Inhalation Type

Among the existing anesthetics of the inhalation type, ether has definite advantages for use in combat areas, it has recently been reported. Factors contributing to the suitability of ether for wartime inhalation anesthesia include the ease with which it can be transported in small cans; the possibility of storing it for indefinite periods; ease and safety of administration by the open drop method; and the relatively lower danger of explosion as compared with other commonly used inhalation anesthetics.



Ease and safety of administration of ether are among the reasons why it has been characterized as the best anesthetic of the inhalation type for use in combat areas.

Offer Ointment Formula For Mustard Gas Burns

WASHINGTON, D. C.—An ointment suggested by the Office of Civilian Defense to relieve the pain and itching of mustard gas burns has the following proportions:

	Parts
Benzyl alcohol	50
Stearic acid	30
Glycerin	10
Ethyl alcohol	8
Pontocaine	1
Menthol	1

Copal Resins Dissolved By Aid of Nascent Oxygen

SUNDBYBERG, Sweden—Difficultly soluble fossil resins, particularly such members of the copal group as Zanzibar, Mozambique, and Congo resins, can be easily dissolved without previous melting by subjecting them to the action of nascent oxygen in the presence of an inert solvent.

This discovery has been made by an inventor here, who has received a U. S. patent on the method. In a typical procedure, the resin is finely divided and mixed with a small amount of manganese peroxide or vanadic acid, acting as a catalytic agent. Over the mixture is poured a suitable solvent: for example, ethanol, or a mixture of 50% ethanol, 40% benzol, and 10% acetone.

A mixture of hydrogen peroxide and nitric acid is then added. Nascent oxygen is released from the hydrogen peroxide, and reacts on the particles of the resin, which quickly dissolve in the solvent, it is claimed.

Say Tincture Preparation Time May Be Shortened

Possibility that the time for preparing tinctures of alkaloids may be shortened is suggested by the work of foreign investigators. According to reports of this work, a tincture of cinchona was first prepared by 10-day maceration with dilute alcohol. This tincture assayed 1.25% alkaloids. It was found that maceration with shaking, using 70% alcohol, yielded a tincture equal in potency to that prepared by the 10-day maceration.

This suggests that by a procedure of shaking and maceration, tincture of cinchona can be prepared in small quantities in a short period of time. It has not yet been determined whether the technique can be applied with equal success to other tinctures.

Describes Novel Method of Testing Greaseproof Paper

APPLETON, Wis.—A titanium pigment dispersed in ethanol plays a part in a new method for evaluating greaseproof paper, according to a patent issued to two inventors here.

The pigment is applied to one side of the paper and an oil dye to the other. If any of the oil dye penetrates the sheet, it will be absorbed into the pigment coating, producing a stain. The effectiveness of the greaseproofing is determined by comparing the appearance of the test sample, after a definite time, with a standard sample.

Lists Many Esters Helpful in Abating Foaming of Casein

Recent Research Throws Further Light on Most Effective Agents

NEWTON, Mass.—A new insight into ways of preventing foaming of casein paints and other protein compositions has been given as a result of research outlined in a patent recently granted to an inventor here.

According to the inventor's theory, foam formation and prevention in protein compositions are related to the action taking place at the interface between the protein composition, the air phase, and the film of anti-foaming material. It is suggested that the formation of the foam results from an increased concentration of the protein material at the interface. The surface tension of the water is thus lowered sufficiently to allow the formation of bubbles of foam.

Effect of Anti-foaming Agents

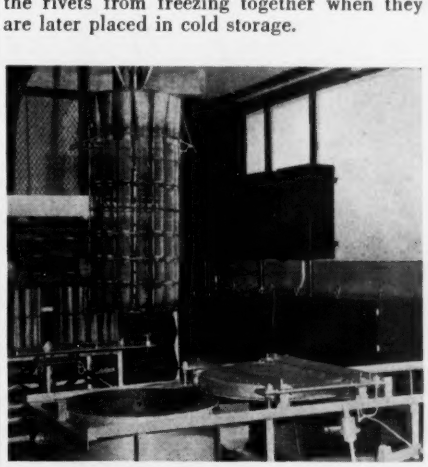
If an anti-foaming agent is present in an amount greater than is needed to saturate the protein film, the protein, according to this

(*Continued on next page*)

Alcohol Quench Prevents Aluminum Alloy Rivets From Sticking Together

Aluminum alloy rivets used in aircraft construction by The Glenn L. Martin Company are prevented from sticking together by immersing them in an alcohol quench tank.

The rivets are of the type which, immediately after heat treatment, are placed in refrigerated storage to keep them soft and workable until they are to be used. (U.S.I. CHEMICAL NEWS, September, 1941.) At the conclusion of the heat treatment, the rivets are first quenched in water, and then in alcohol at 0° F. or less. The alcohol quench aids in preventing the rivets from freezing together when they are later placed in cold storage.



Quench basket containing rivets is lowered into alcohol quench tank, which helps to prevent them from sticking together.

December ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Solvent Blend Addition Helps Prevent Clogging Of Oil Burning Systems

CHICAGO, Ill. — The clogging and fouling of domestic and commercial fuel oil burners can be prevented to a large extent by the addition of small amounts of a suitable solvent blend to the fuel oil.

This discovery is outlined in a recently issued patent assigned to a manufacturer here. In general terms, the solvent blend consists of: a compound boiling over 350° F. and having excellent gum solvent properties at elevated temperatures; and a compound boiling below 350° F. and having good gum solvent properties at ordinary temperatures.

A particularly effective solvent blend, it is indicated by the patent, consists of dibutyl phthalate and ethyl acetate. It is claimed that the addition of such a blend is helpful not only in preventing fouling of the oil burning system, but also in removing existing gummy deposits.

Dibutyl phthalate and ethyl acetate are produced by U.S.I.

Dibutyl Phthalate Nearest To Universal Plasticizer

Dibutyl phthalate represents the nearest approach to a universal plasticizer for grinding pigment pastes to be added to lacquers, it was suggested in a recently conducted question-and-answer forum on paint problems. The dibutyl phthalate absorption of pigments is approximately twice that of raw linseed oil.

Dibutyl phthalate is particularly suitable for grinding pigments for addition to nitrocellulose lacquers. For cellulose acetobutyrate lacquers, it is suggested that a mixture of dibutyl and dimethyl phthalates should prove most satisfactory.

Synthetic Camphor Yield

(Continued from preceding page)

chlorination of the residue in the presence of 95% ethanol. The ethanol serves as a common solvent for the components of the residue and for the dehydrochlorinating reagent.

The treatment, it is said, does not affect the bornyl chloride, but the other components of the residue become dehydrochlorinated, and can be separated from the bornyl chloride by distillation.

Recovery is reported to be as high as 25 to 35% by weight of the residue.

Revised Specifications For Road-Marking Paints

WASHINGTON, D. C. — New specifications have been issued for road-marking paints, to conform with regulations permitting the use of limited amounts of Batu and Congo Copal gums in paints of this character.

Under present regulations, up to one pound of Batu or two pounds of Congo can be used per gallon of road-marking paint. The revised specifications take into account this easing of restrictions on the use of natural resins.

U.S.I. will refer readers to a source from which the new specifications can be obtained.

Foam-Abating Agents

(Continued from preceding page)

theory, is either precipitated out of the solution, or is reduced in concentration so that it no longer lowers the surface tension of the water. Consequently, foam formation is abated.

It is obvious that the application of this theory to foam prevention requires the use of an agent exceeding that necessary to saturate the solution. This result can be obtained, the inventor claims, by means of esters which are soluble to only a limited extent in water, and which have a higher boiling point. When these esters are added to the protein compositions in amounts exceeding their solubility in water, at least a molecular layer of undissolved ester is always present between the surface of the protein solution and the adjacent surface of the air layer.

Suitable Esters

In this way, a permanent anti-foaming effect can be produced, according to the inventor. The patent lists a considerable number of esters which meet the necessary requirements. Among the U.S.I. products included in the list are:

Amyl acetate
Butyl acetate
Butyl ethanedioate
Dibutyl phthalate
Diethyl carbonate
Diethyl phthalate
Ethyl acetate
Ethyl ethanedioate

The use of these esters is expected to be effective in abating foam formation in casein and other protein compositions for such applications as paints, inks, and paper coating.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

An abrasion-resistant plastic is described as transparent, insoluble in common solvents, 20 to 30 times as resistant to abrasion as most clear plastics. Maker says that it retains its shape when exposed to high atmospheric temperatures, can be formed into large sheets at low pressures. **(No. 640)**

U S I

A textile finishing agent is said to be useful in replacing sulfonated tallow. It is claimed that 100 pounds of the new agent will do the work of 140 pounds of sulfonated tallow, and that the cost compares favorably. **(No. 641)**

U S I

A paper fabric is suggested by the manufacturer as a substitute for cloth and burlap. It is said that the cellulose fibers are effectively interlocked and fastened, resulting in high inherent wet strength independent of any coating or sizing on the surface. **(No. 642)**

U S I

A sealing liquid is said to protect wood or concrete against attack or infiltration by oil and gasoline, and can also be applied as a protective coating on steel. According to the maker, it resists attack by many solvents and fatty acids. **(No. 643)**

U S I

A multiple-drum mixer will handle four 50-gallon drums and the same number of 5-gallon drums, rotating them at 30 RPM to mix their contents. **(No. 644)**

U S I

Temporary protection for metal parts in storage or transit is provided by a new liquid which dries to form a stable, non-adhesive film, according to the manufacturer. It is claimed that the film is unaffected by oil, grease, gasoline, water, alcohol, brine solutions, will not become brittle under sunlight, and that it peels off as a complete film. **(No. 645)**

U S I

A new Buechner filter is said to retain all the advantages of this type of funnel, with the added feature of physical stability. The entire unit is supported by a cylindrical base that rests firmly on the table, and the filtrate is drawn off through a vacuum connection at the bottom. **(No. 646)**

U S I

Low actinic glassware has been developed especially to meet the need for colored laboratory glassware affording high protective value to certain light-sensitive substances, it is reported. The protecting red color is described as an integral part of the glassware. **(No. 647)**

U S I

A polarizing film is said to require no scarce imported materials in its manufacture. It is also available in the form of laminated glass, and while material is used for war purposes, limited supplies are reported available for experimental purposes. **(No. 648)**

U S I

A form liner for concrete is said to contain no restricted materials, and to strip cleanly away from a finished concrete surface. It is reported to be cheap enough to discard after use. **(No. 649)**

FOREIGN LITERATURE DIGEST

By T. E. R. Singer

BOLETIM DO CONSELHO FEDERAL DE COMMERCIO EXTERIOR, Vol. V, No. 25 (1942) pp. 3-7.

Ferrous Metallurgy in Brazil: At present there are twenty-eight metallurgical companies in actual operation in Brazil. All these plants employ a total of 12,606 operators and have a registered capital of 838,747 contos and an invested capital of 365,429 contos.

The state of Minas Gerais has the largest number of these plants—a total of ten plants with a registered capital of 249,500 contos and an invested capital of 215,712 contos. There are some 6,390 metallurgical operators in this state alone. The most important producing metallurgical firm, the Companhia Siderurgica Belgo-Mineira, is also located in Minas Gerais. This company was founded at the end of 1921 and at present employs 2,999 men. Its chief product in 1941 was sheet iron, of which it produced 82,000 tons, at a value of 108,000 contos, or 57% of the value of the country's total production. This company is also the nation's greatest producer of steel, producing 92,000 tons in 1941, or 50% of the value of the nation's total production. Its pig iron production was 79,000 tons in 1941, or 37% of the country's total. The Companhia Belgo-Mineira has two plants, both of them in Minas Gerais.

A detailed table follows this report, giving the 1941 production in tons of pig iron, sheet iron, and steel and their respective values for each Brazilian firm individually.

BOLETIM DO CONSELHO FEDERAL DE COMMERCIO EXTERIOR, Vol. V, No. 31 (1942) p. 9.

Rubber: The United States has made an agreement with Bolivia to buy all the rubber that country produces for several years. Although the terms of the contract are not known, Bolivia will furnish the United States with 1500 tons of rubber annually. The price will vary according to quality, starting with 45 centavos per pound. The United States is advancing $2,125,000 to Bolivia to be used in the scientific cultivation of the rubber, the construction of roads and the improvement of living conditions in the producing zones.

It appears that Argentina made offers to Bolivia to purchase its rubber, but it was not willing to sign a long-term agreement or spend any capital in its production.

REVISTA DE QUIMICA INDUSTRIAL (Review of Industrial Chemistry) (Rio de Janeiro) Vol. XI, No. 119 (1942), pp. 16-22.

Pyrethrum Cultivation in South Rio Grande: Dr. W. Mohr, Agricultural Chemist on the Brazilian Government staff, has written an excellent report on pyrethrum and the pyrethrines.

Pyrethrum, due to its property of being non-poisonous to man and warm-blooded animals, has become so popular for insecticidal use within the last two decades that its demand frequently exceeds the supply. It is used as a base in the preparation of almost all the household sprays such as "Flit." It is also replacing poisonous constituents in plant sprays and its wider application in this field has been restricted only by its high cost. Pyrethrum has also been attracting attention in medicine as a vermifuge.

Pyrethrum was first cultivated in the state of South Rio Grande about 1890 by Rene Coulon, and was grown on a small scale until 1922. Since then it has been cultivated in other parts of the state on a large scale, particularly in Taquara, Pelotas and Cangussu. In the season of 1938-39 these centers produced for sale about 200,000 kilos of the dry flower, most of which was exported to Europe and North America.

South Rio Grande is very favourable to the cultivation of pyrethrum. The climate and the soils of the areas of high altitude are very suitable. Once started, the plants produce for seven to ten years and do not require much attention. The flowers can be gathered in October, with maximum production during November, December and January. Constant inspection is necessary to insure collection at the proper time, and this makes it difficult, from an economical point of view, to cultivate pyrethrum on large plantations. If large areas of agricultural country were distributed among a large number of small-scale owners in the South of Brazil, Brazil could readily take second place among producers and exporters of pyrethrum.

The rest of the report is devoted almost entirely to analytical data obtained with the Brazilian flower in the Laboratory of Agricultural Chemistry. The pyrethrines were extracted from the flower and carefully analyzed. The method of extraction, saponification, purification and titration of the pyrethrines is given, accompanied by tables containing very detailed analytical data.

A final section deals with the effect of storage on the quality of the pyrethrum, including a table showing the loss of pyrethrines on storage for two given lengths of time under the following conditions: without pressure in cotton bags; with a pressure of 1,000 lbs. per sq. in.; with a pressure of 5,000 lbs. per sq. in.; with a pressure of 10,000 lbs. per sq. in.; with a pressure of 16,000 lbs. per sq. in.; with a pressure of 10,000 lbs. per sq. in. and containing anti-oxidant.

Industry's Bookshelf

(*Continued from page 901*)

ranged systematically. In this volume (the second of the series) an attempt has been made to treat the first category of problems discussed above and to take the reader shortly through those parts of general and physical chemistry particularly necessary to a study of the high polymers.

Prodinger, Wilhelm. Organic reagents used in quantitative inorganic analysis. Translated from the second German edition by Stewart Holmes. Foreword by O. Baudisch. New York: Elsevier Publishing Co., Inc., 1940. xiv, 203 p. diagrs. $5.00. Reviewed by T. E. R. Singer.

Organic reagents are being used in ever increasing numbers for carrying out quantitative determinations. In this book, an attempt has been made to survey the most important organic precipitants not only with the sincere purpose of collecting and interpreting this interesting chapter of analytical chemistry in one volume but also with the hope that the practical analyst will find some useful applications and in the possibility of further development of his work. The general desire for rationalization of analytical procedures raises the question of whether or not tne use of relatively expensive reagents is to be recommended. There can be no real doubt as to the value of organic reagents since they give more exact results and in a far shorter time than other reagents used so far. If one considers further that the high sensitivity, i. e. the low limit of identification, and the correspondingly far-reaching precipitation of the cations permits, in many cases, the use of micro analytical procedures needing only a few milligrams, then the high initial cost has no real significance.

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - Nov. 1942 $0.92

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks lb.	...	.11	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks lb.	...	.12	.12	.12	.11	.13
Acetamide, tech, kgs, wks lb.	.28	.50	.28	.50	.28	.45
Acetanilid, tech, cryst, bbls lb.	.29	.31	.29	.31	.29	.31
powd, bbls lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs lb.	..	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) lb.	...	.07	.07	.158	.06	.158
drs, c-l, delv (*PC*) lb.	...	.08½	.08½	.173	.07½	.173
Acetonitrile, drs, wks lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenctidin, bbls, kgs, 1000 lbs lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks 100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls lb.	...	.45	.45	.45	.45	.45
Standard USP lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls lb.		.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.00	1.07	1.00	1.85	1.85	2.10
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls lb.	.43	.47	.43	.47	.43	.47
USP, bbls lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 40 tons ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks lb.	...	.22	.22	.22	.22	.22
tks, wks lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks lb.	..	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks lb.		.02½	.02½	.02½	...	...
Chromic, drs (*FP*) lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.83	.81	.86	.76	.84
Low Boiling gal.	.81	.83	.81	.86	.76	.84
Formic, tech, cbys lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluosilic, 35%, bbls lb.						
Hydrofluoric, 30%,	.06	.06½	.06	.06½	.06	.06½
bbls, wks lb.	.09	.09½	.09	.09½	.09	.09½
Hydrofluosilic, 35%, bbls lb.	.029	.0315	.029	.035	.02½	.035
Lactic, 22% dark, bbls lb.	.039	.0415	.039	.0415	.03½	.0415
22%, light, bbls wks lb.	.063	.0655	.063	.0655	.05½	.0655
44%, dark, bbls wks lb.	.073	.0755	.073	.0755	.06½	.073
44%, light, bbls wks lb.	.20	nom.	.20	.20½	.15	.18¼
Lauric, dist, tech, drs lb.	...	.45	.45	.45	.45	.45
Laurent's bbls lb.	...	.30	.30	.30	.30	.30
Maleic, powd, drs lb.	.25	.26	.25	.26	.25	.26
Anhydride, drs lb.	...	.47	.47	.47	.47	.47
Malic, powd, kgs lb.	.05	.06	.05	.06	.05	.06
Mixed tks N unit lb.	.0085	.009	.0085	.009	.0085	.009
S unit lb.	.95	1.10	.95	1.10	.95	1.10
Molybdic, kgs, wks lb.						
Monochloracetic, tech,	...	.17	.17	.17	.15	.18
bbls lb.	...	1.50	1.50	1.50	1.50	1.50
Monosulfonic, bbls lb.						
Muriatic, 18° cbys,	...	1.50	1.50	1.50	1.50	1.50
c-l wks 100 lb.	...	1.05	1.05	1.05	1.05	1.05
tks, wks 100 lb.	...	1.75	1.75	1.75	1.75	1.75
20° cbys, c-l, wks 100 lb.	...	1.15	1.15	1.15	1.15	1.15
tks, wks 100 lb.	...	2.25	2.25	2.25	2.25	2.25
22° cbys, c-l, wks 100 lb.	...	1.65	1.65	1.65	1.65	1.65
tks, wks 100 lb.	.06½	.08	.06½	.08	.06½	.08

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocation. (*FP*) Under full priority control. (*PC*) Under price ceiling.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acids (continued):						
CP cbys lb.	.19	.19½	.18	.19½	.18	.18½
Myristic, dist, drs lb.	.13	.14	.10	.14	.10	.10
Naphthenic drs, 220-230 lb.	.10	.13	.09	.13	.09	.09
tks, wks (A) lb.	.60	.65	.60	.65	.60	.65
Naphthionic, tech, bbls lb.	5.00	5.50	5.00	7.15	7.15	7.15
Nicotinic fib-dms (Niacin) lb.						
Nitric, 36°, cbys, c-l,	...	5.00	5.00	5.00	5.00	5.00
wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
38°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
40°, c-l, cbys, wks 100 lbs. *c*		6.50	6.50	6.50	6.50	6.50
42°, c-l, cbys, wks 100 lbs. *c*	.11½	.13	.11½	.13	.11½	.13
CP, cbys lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Oxalic, bbls, wks (*PC*) lb.						
Phosphoric, 85% USP,	...	.12	.12	.12	.12	.12
cbys lb.						
50% food grade, c-l, bbls,	4.00	4.25	4.00	4.25	4.00	4.25
wks, frt equal 100 lbs.	.65	.70	.65	.70	.65	.70
Picramic, kgs lb.	.	.35	.35	.35	.35	.35
Picric, bbls, wks lb.	...	.14	.14	.14	.14	.14
Propionic, pure, drs, wks lb.	...	.11	.11	.11	.11	.11
tks, wks lb.						
Pyrogallic, tech, lump,		1.45	1.45	1.45	1.45	1.45
pwd. bbls lb.	2.10	2.15	2.10	2.15	1.70	2.25
USP, cryst, dms lb.		.25	.25	.25	.25	.25
Pyroligneous, bbls, delv gal.	.32	.37	.32	.37	.32	.37
Ricinoleic, tech, drs, wks lb.						
Salicylic, tech, 125 lb bbls,		.33	.	.33		.33
wks (*PC*) lb.	.35	.46	.35	.46	.35	.40
USP, bbls lb.	65	.69	.65	.82	.82	.82
Sebasic, tech, bbls, wks lb.						
Stearic, see under Oils & Fats	...	.75	...	.75	...	.75
Succinic, bbls lb.	...	.17	...	.17	...	.17
Sulfanilic, 250 lb drs, wks lb.	...	13.00	...	13.00	...	13.00
Sulfuric, 60°, tks, wks ton	...	1.25	...	1.25	...	1.25
c-l, cbys, wks 100 lb.	...	16.50	...	16.50	...	16.50
66°, tks, wks ton	...	1.50	..	1.50	...	1.50
c-l, cbys, wks 100 lb.	.06½	.08	.06½	.08	.06½	.08
CP, cbys, wks lb.						
Fuming (Oleum) 20% tks.	...	19.50	...	19.50	18.50	19.50
wks ton						
Tannic, tech, 300 lb bbls lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure 100 lb. pkg. (A) lb.	.	2.86		2.86	no prices	
Acrylonitrile, tks (A) lb.	...	.39	.34	.39	...	...
Albumen, light flake, 225 lb bbls lb.	.65	.70	.65	.75	.55	.75
dark, bbls lb.	...	.13½	.12½	.14	.13	.18
egg, edible lb.	1.75	1.76	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane)						
tks, delv lb.	...	.131	...	.131	.111	.131
c-l, drs, delv lb.	...	.141	...	.141	.121	.141
lcl, drs, delv lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich lb.	...	.27	.25	.27	.25	.27
secondary, tks, delv lb.						
drs, c-l, delv E of Rockies lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd lb.	...	.09	...	.09	...	.09
Benzyl, cans lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, **tks, f.o.b.** wks, frt all'd (*PC*) (A) lb.	.12½	.14¼	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd lb.	...	.15¼	.13½	.173	.10	.168
Butyl, secondary, tks, delv lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs lb.	...	.13	...	.13	...	.13
tks lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks.	...	.53	...	.53	.28½	.53

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv ....lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv ....lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv ....lb.	.11	.13½	.11	.13½	.09	.12
tks, delv ....lb.	.10	.12½	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks ....gal *g*	...	11.92	8.12	11.92	5.96½	8.12
c-l, drs ....gal *g*	...	12.02½	8.19	12.02½	6.02½	8.19
c-l, bbls ....gal *g*	...	12.06½	8.25½	12.06½	6.03½	8.25
Furfuryl, tech, 500 lb drs lb.	.20	.35	.20	.35	.20	.25
Hexyl, secondary tks, delv lb.	...	.23	...	.23	.12	.23
c-l, drs, delv ....lb.	...	.24	...	.24		.13
Isoamyl, prim, cans, wks lb.	...	.32	...	.32		.32
drs, lcl, delv ....lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs lb.	...	.086	...	.086	.079	.086
c-l, drs ....lb.	...	.076	...	.076	.069	.076
tks ....lb.	...	.076		.076	.069	.076
Ethylhexyl, tks, wks ...lb.	.23	.25	.23	.25	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd ....gal.	.39	.43½	.40½	.43½	.40½	.43½
tks, frt all'd ....gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd ..gal.	.44	47	.44	.47	.44	.47
tks, frt all'd ....gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs ....lb.	...	.65	.54	.65	.26	.54
B fib drs ....lb.	.60	.65	.60	.70	...	...
Propyl, nor, drs, wks gal.	.67	.70	.69	.75	...	...
Spec Solvents, East, drs, wks ....gal.	...	.61	.61	.70	...	...
tks, East, wks ....gal.	...	.54	.54	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks ....lb.	.44	.50	.44	.50		
Aldehyde ammonia, 100 gal drs ....lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv ....lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ....lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls ....lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ....lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila ..100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls, wks ....100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks 100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks ....100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks ....100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks 100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks ....100 lb.	...	3.25	...	3.25		3.25
Chrome, bbls ......100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*) ....100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls ....lb.	.09½	.10½	.09½	.11	.10½	.11
Basic powd, bbls, delv lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv ..lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ...lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ....lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv (A) ......lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks ....lb.	...	.034	...	.034	.029	.03½
Oleate, drs ....lb.	...	.24½	.17½	.26	.17½	.20
Palmitate, bbls ....lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls ....lb.	...	.15½	.15	.15½		.15
Stearate, 100 lb bbls ...lb.	.23	.24	.22	.24	.18	.23
Sulfate, com, c-l, bgs, wks ....100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks ...100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks ....100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks ....100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv ..lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.	...	.04	.04	.08*z*	.04	.05¼
Ammonium Acetate, kgs ..lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ....100 lb.	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls ..lb.	.16	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls ....lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks ......100 lb.	...	4.45	4.45	...	4.45	...
Gray, 250 lb bbls, wks ....100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls ...lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ....lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ....lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs ....lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ....lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs (A) ...lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs lb.	.25½	.28½	.21	.28½	.21	.22

z On a f.o.b. wks. basis.
(A) Allocation.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, dibasic tech, powd, 325 lb bbls ...lb.	...	.07¼	.09¼	.09¼	.07¼	.09¼
Ricinoleate, bbls ....lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls ...lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ....lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk (A) ....ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)						
tks, delv ....lb.	...	.145	...	.145	.105	.145
c-l, drs, delv ....lb.	...	.155	...	.155	.115	.155
lcl, drs, delv ....lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv lb.	.14½	.17	.14½	.17	...	.14½
Secondary, tks, delv ...lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	...	.09½
tks, delv ....lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	no prices		.56	.68	.56	.68
mixed lcl drs, wks ..lb.	...	.08	...	.08	.0565	.08
tks, wks ....lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl)						
lcl, drs ....lb.	...	.102	...	.102	...	...
cl, drs ....lb.	...	.095	...	.095	...	...
tks ....lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks ...lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs ...lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs ..lb.	...	.32½	...	.32½	.26	.335
Amylene, c-l, drs, f.o.b. wks ....lb.	...	.10½	.102	.11	.102	.11
lcl, drs, f.o.b., wks	...	.11	...	.11	...	...
tks, f.o.b., wks ....lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ....lb.	.12½	.16	.12½	.16	...	.14½
Annatto fine ....lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% .....lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ....lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots ....lb.	...	.14½	.14	.14½	.14	.16½
Butter of, see Chloride						
Chloride, soln, cbys ....lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ....lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls (A) lb.	.15	.15½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs lb.	...	.40	.34	.40	.28	.34
Archil, conc, 600 lb bbls lb.	...	.26	...	.26	no prices	
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ....lb.	.09½	.09¾	.09½	.10¾	.09½	.10¾
Arsenic, Metal ....lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs ....lb.	no prices		no prices		no prices	
White, 112 lb kgs (A) lb.	.04	.04¾	.04	.04¾	.03½	.04¾
B						
Barium Carbonate precip, 200 lb bgs, wks ....ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY (A) ....lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1 ....ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls ..lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls ....lb.	.11	.12	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks ....ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk mines (A) ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ....ton	...	16.00	...	16.00	...	16.00
200 mesh ....ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ....lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	(A)	.15	...	.15	.14	.15
90% c-l, drs ....gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls ....lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ....lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	...	1.25	1.25	...	1.25	1.35
Tech, 200 lb bbls ....lb.	...	.51	...	.51	.51	.52
Bismuth metal ....lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ....lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes ......lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ....lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, fib drs ....lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs ......lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs ..lb.	1.29	1.33	1.29	1.57	1.20	1.57
Trioxide, powd, boxes ..lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb bbls, wks ....ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks ....lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	4.95	5.25	5.75	4.75	5.25
Chicago, high grade ..unit	...	5.38	5.40	5.90	5.00	5.40
Imported shipt ......unit	...	nom.	5.00	5.50	4.75	5.00
Blues, Bronze Chinese						
Prussian Soluble ....lb.	...	.36	...	.36	.33	.36
Milori, bbls ....lb.	...	.36	...	.36	.33	.36

h Lowest price is for pulp; highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Blues (continued):						
Ultramarine,* dry, wks, bbls ....lb.	.12	.13	.11	.13	...	.11
Regular grade, group 1 lb.	.17	.27	.16	.27	.16	.20
Pulp, Cobalt grade ..lb.	.23	.27	.22	.27	.22	.24
Bone, 4½ + 50% raw, Chicago ....ton	...	39.50	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv ..ton *i*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv (*FP*) ... ton *i*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs ....ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv ....ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs ..lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*) ....lb.	...	.59	...	.59	...	.57
Gold, blk ....lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks (*PC*) ....lb.	.02½	.03½	.02½	.03½	.02½	.03
Butyl, acetate, norm drs, frt all'd ....lb.	.14½	.15¾	.14½	.168	.10	.168
tks, frt all'd ....lb.	.13½	.14¾	.13½	.158	.90	.158
Secondary, tks, frt all'd lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd ....lb.	...	.09½	...	.09½	.08¼	.09½
Aldehyde, 50 gal drs, wks ....lb.	.14½	.16½	.14½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs ....lb.	...	.35	.28	.35	...	...
c-l, drs ....lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv ....lb.	...	.35	...	.35	...	.35
Lactate ....lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd ...lb.	...	.35	.25	.35	...	.25
Propionate, drs ....lb.	.16½	.17	.16¼	.17	.16½	.17
tks, delv ....lb.	...	.15½	.15½	.35	...	.25
Stearate, 50 gal drs ... lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs ....lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
C						
Cadmium Metal (*PC*) ...lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs ....lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs ....lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l ....ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv ....ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb. bbls ....lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks ....lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ...ton	no prices		no prices		no prices	
Palmitate, bbls ....lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls ....lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls ..lb.	.15	.16	.13	.16	.13	.14
Stearate, 100 lb bbls ..lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs ....lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder ....lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants ....lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv ....lb.	...	.83	.73	.83	.66½	.73
Casein, Standard, Dom, grd lb.	.19	.21	.15	.30½	.11½	.31
80-100 mesh, c-l bgs ..lb.	.19½	.21½	.15½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks (*PC*) ..... ton	...	19.00	16.00	19.00	15.00	16.00
Imported, ship, bgs ...ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs lb.	.13	.15	.13	.15	.12	.15
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs ....lb.	.30	.35	.30	.35	...	.30
Triacetate, flake, frt all'd ....lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls lb.	...	.02¾	...	.02¾	.02¾	.02¾
Precip, heavy, 560 lb cks ....100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	27.50	38.50	25.00	38.50	25.00	36.00
Willow, powd, 100 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks ....lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk ...ton	19.00	24.00	18.60	24.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) (A) .....lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract ..lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract 100 llb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont ....lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks ....lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks ....lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs ....lb.	...	.20	...	.20	...	.20
USP, 650 lb drs ....lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls ..lb.	...	.80	...	.80	...	.80
Chrome, Green, CP .....lb.	.23	.33	.23	.33	.21	.25
Yellow ....lb	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls ....lb.	...	.07½	.07½	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls ....lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ....bbl.	8.25	9.25	7.50	9.25	7.50	7.75
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A) lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A) .....lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls ...lb.	...	.44	.42	.44	.33	.42
paste, 5%, drs ....lb.	.32	.35	.31	.35	...	.31
Oxide, black, bgs (A) ..lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls ..lb.	...	.15	.13½	.15	...	.13½
Precipitated, bbls ....lb.	...	.38	.34	.38	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs ....lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv ....lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls ....lb	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls (A) ....lb.	...	.23¼	.19½	.23¼	.16	.19½
Cyanide, 100 lb drs ...lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls ...lb.	.22	.29½	.20	.29½	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls .....lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks (A) ....100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks ....ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls 100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls 100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls ....100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls ....lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks .....gal.	...	.15½	...	.15½	.13½	.15½
Grade 2 ....gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l (A) lb	.10¼	.11¼	.10¼	.11½	.09¼	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks ....lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale lb.	no supplies		...	.05¼	.04¼	.05¼
Cyanamid, pulv, bgs, c-l, frt (A) all'd, nitrogen basis, unit	1.52½ nom.		no prices		...	1.40
D						
Derris root 5% rotenone, bbls ....lb.	...	.35	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago ....100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs ....100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs lb.	...	.10	.09½	.10	.08	.08½
White, 220 lb bgs, lcl lb.	.09½	.11¼	.09½	.11¼	.08½	.09
Tapioca, 200 bgs, lcl ....lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs ....100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.47	.50
lcl, drs, wks ....lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks .....lb.	...	.105	...	.105	.095	.105
lcl, drs ....lb	...	.112	...	.112	...	...
tks, wks ....lb.	...	.09½	...	.09½	.08½	.09½
Diamylether ....lb.	...	...	...	...	.085	.102
lcl, drs ....lb.	...	.112	.102	.112	...	...
c-l, drs ....lb.	...	.105	.095	.105	...	...
tks ....lb.	...	.095	.085	.095	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks ....lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs ...lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks lb.	...	.22	.21	.22	.21	.21½
Diamyl Sulfide, drs, lcl ....lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ....lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.64	.53	.64	...	.53
c-l, drs, wks ....lb.	...	.61	.50	.61	...	.50
tks, wks ....lb.	...	.59	.48	.59	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd ....lb.	.21	.23½	.21	.23½	.19	.20
Dibutyltartrate, 50 gal drs lb.	...	.92	.87	.92	.50	.87
Dichlorethylene, drs ....lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks ....lb.	.15	.16	.15	.16	.15	.16
tks, wks ....lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs lb.	...	.037	...	.037	.025	.04
lcl, drs ....lb.	...	.045	...	.045		
tks, wks ....lb.	...	.03	...	.03	.0221	.025

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.
(A) Allocation.

* These prices were on a delivered basis.

	Current	Market	1942 Low	1942 High	1941 Low	1941 High
Diethanolamine, tks, wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks ....lb.	...	.81	.70	.81	...	.70
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss ....lb.	...	.75	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.22	.21½	.22	.19	.20
Diethylsulfate, tech, drs, wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ....lb.	..	.13½	..	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks ....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	.31	.33	.16	.33	...	.16
Oleate, bbls ....lb.	...	.17	...	.17	...	.17
Stearate, bbls ....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd .....lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls .... lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls ....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	.	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls ....lb.	...	.15	...	.15	.15	.20
Diphenylamine (A) ......lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs ....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	80.00	55.00	80.00	32.00	52.00
Extract ....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
EggYolk, dom, 200 lb cases lb.	1.00	1.10	.87	1.10	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY ....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .... 100 lb.	...	2.00	2.00	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ....lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs ..lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ....lb.	..	.06	...	.06	...	.06
Nitrous conc bottles ...lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks ....lb.	...	.12½	.08	.12½	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd ....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd ....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ..lb.	.11¼	.12¼	.11¼	.12¼	.06¼	.12¼
drs, frt all'd ...... lb.	.12¼	.13¼	.12¼	.13¼	.07¼	.13¼
Acetoacetate, 110 gal drs lb.	..	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs .....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ..lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd lb.	...	.27¼	...	.27¼	.25	.27¼
Lactate, drs, wks ......lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks .....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks .... lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs .... lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont .... lb.	.75	.85	.75	.85	.75	.85
Anhydrous .... lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies .... lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks lb.	...	.15½	.14½	.18½	.14½	.18½
tks, wks ....lb.	...	.14½	.13½	.14½	...	.13½
Mono Butyl Ether, drs, wks .... lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks ....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs, wks .... lb	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .... lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks ... lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks .... lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks .... lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks ....lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl ....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ... ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks .... ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling. (A) Allocation.

Current

Fish Scrap
Karaya

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) ....unit *l*	no prices		4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	no prices		2.75	4.50	2.75	3.25
Fluorspar, 98% bgs (*PC*) ton	28.00	32.00	28.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP, PC*) ......lb.	.055	.0575	.055	.0575	...	...
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50	15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ...ton	30.00	40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	.15	.20	.15	.20	.10	.15
tks, wks ....lb.	...	.09	...	.09	...	.09
Furfuramide (tech) 100 lb drs ....lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18½	.19½	.18	.19½	.16	.19½
Fustic, crystals, 100 lb boxes ....lb.	.28	.32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½	.16	.12½	.16	.10½	.16
Solid, 50 lb boxes .....lb.	.19	.21	.19	.21	.19	.21
G						
G Salt paste, 360 lb bbls lb.	...	.45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices		...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs ....100 lb.	.30	nom.	.12½	.30	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks ....100 lb.	1.05	1.25	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate						
Glue, bone, com grades, c-l bgs ....lb.	.15½	.18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19	.30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs ..lb.	...	.18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs ..lb.	...	.18¼	...	.18¼	...	.18¼
Saponification, drs .....lb.	...	.12¼	...	.12¼	.09½	.20½
Soap Lye, drs ....lb.	...	.11½	...	.11½	.07⅛	.18
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ..lb.	...	.27	...	.27	...	.27
Monostearate, bbls .....lb.	...	.30	...	.30	...	.30
Oleate, bbls ....lb.	...	.22	...	.22	...	.22
Phthalate ....lb.	...	.38	...	.38	...	.38
Glyceryl Stearate, bbls ..lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls ..lb.	...	.22	...	.22	...	.22
Phthalate, drs ....lb.	...	.38	...	.38	...	.38
Stearate, drs ....lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes ...lb.	.80	.85	.80	.85	.80	.95
Arabic, amber sorts ....lb.	.14½	.15	.14½	.24	.14	.25
White sorts, No. 1, bgs lb.	.33	.35	.33	.35	.35	.45
Powd, bbls ....lb.	.20	.21	.20	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ....lb.	.05¼	.12	.04½	.12	.04½	.05½
California, f.o.b. NY, drs ton	35.00	40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ....lb.	.50	.55	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque ....lb.	...	.49½	...	.49½	...	.49½
Dark amber ....lb.	...	.12¾	...	.12¾	...	.12¾
Light amber ....lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs						
Macassar pale bold ....lb.	...	.17⅛	...	.17⅛	.12¾	.17⅛
Chips ....lb.	...	.11½	...	.11½	.06¾	.11½
Dust ....lb.	...	.07	...	.07	.05¼	.07
Nubs ....lb.	...	.13⅛	...	.13⅛	.10½	.13⅛
Singapore, Bold ....lb.	...	.22⅛	...	.22⅛	.15¾	.22⅛
Chips ....lb.	...	.12⅛	...	.12⅛	.08½	.12⅛
Dust ....lb.	...	.07	...	.07	.05¼	.07
Nubs ....lb.	...	.17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb (A)	...	.14½	.14	.14½	.13⅞	.14
Loba B ....lb.	...	.13¾	.13¾	.14¼	.11¾	.14¼
Loba C ....lb.	...	.13⅜	.13⅜	.13⅞	.11¼	.13⅞
DBB ....lb.	...	.11	.11	.12¼	.10	.12¼
MA sorts ....lb.	...	.09¾	.09¾	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold gen. (A) lb.	...	.22⅜	.22⅜	.22⅞	.15⅜	.22⅞
Chips ....lb.	...	.12⅜	.12⅜	.14½	.10	.14½
Mixed ....lb.	...	.17⅜	.17⅜	.17⅞	.14⅜	.17⅞
Nubs ....lb.	...	.18⅜	.18⅜	.18⅞	.12¾	.18⅞
Split ....lb.	...	.19⅛	.19⅛	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases	(A)					
A ....lb.	...	.35¾	...	.35¾	.21⅜	.35¾
B ....lb.	...	.34⅜	...	.34⅜	.20¼	.34⅜
C ....lb.	...	.28⅝	...	.28⅝	.14⅝	.28⅝
D ....lb.	...	.25⅝	...	.25⅝	.13¼	.25⅝
A/D ....lb.	...	.28⅜	...	.28⅜	.15¼	.28⅜
A/E ....lb.	...	.25⅝	...	.25⅝	.12⅞	.25⅝
E ....lb.	...	.18¾	...	.18¾	.10	.18¾
F ....lb.	...	.13¾	...	.13¾	.08	.13¾
Singapore, No. 1 ......lb.	...	.30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 ....lb.	...	.25⅜	...	.25⅜	.12¼	.25⅜
No. 3 ....lb.	...	.12⅜	...	.12⅜	.07⅛	.12⅜
Chips ....lb.	...	.23½	...	.23½	.11	.23½
Dust ....lb.	...	.13	...	.13	.07⅛	.13
Seeds ....lb.	...	.17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l (A) ......lb.	...	.08⅞		.08⅞	.08½	.08⅞
Ester ....lb.	...	.10	.08½	.10	.06¼	.09½
Gamboge, pipe, cases ....lb.	2.30	2.35	.95	2.35	.95	1.00
Powd, bbls ....lb.	2.50	2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs ....lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ...lb.	.14	.33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling. (A) Allocation.

	Current	Market	1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y (A)						
Brown XXX, cases ....lb.	...	.77	.60	.77	...	.60
BX ....lb.	...	.38	...	.38	...	.38
B1 ....lb.	...	.34	.28	.34	...	.28
B2 ....lb.	...	.30	.24	.30	...	.24
B3 ....lb.	...	.27½	.18½	.27½	...	.18½
Pale XXX ....lb.	...	.66	.61	.66	...	.61
No. 1 ....lb.	...	.43	.41	.43	...	.41
No. 2 ....lb.	...	.31	.24	.31	...	.24
No. 3 ....lb.	...	.22	.17¾	.22	...	.17¾
Kino, tins ....lb.	no prices		no prices		no prices	
Mastic ....lb.	3.50	3.75	3.25	3.75	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks ..lb.	.95	.97½	.95	1.10	.50	1.10
Senegal, picked bgs ......lb.	...	.30	...	.30	...	.30
Sorts ....lb.	...	.13	...	.13	...	.13
Thus, bbls ....280 lbs.	...	16.50		16.50	15.00	16.50
Tragacanth, No. 1, cases lb.	3.75	3.80	3.50	4.00	2.75	3.40
No. 2 ....lb.	3.40	3.45	2.00	3.45	2.45	2.80
No. 3 ....lb.	1.10	1.20	1.10	1.20	1.10	2.00
Yacca, bgs (PC) ....lb.	.06	.07½	.06	.07¾	.03½	.07¾
H						
Hematine crys, 400 lb bbls lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls						
wks ....lb.	...	.0385	.03½	.0385	.03⅛	.03½
tks ....lb.	...	.0325	.03	.0325	.02¾	.03
Hexalene, 50 gal drs, wks lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks (PC) ..gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (FP) .....lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs ....lb.	.13	.13½	.13	.13½	.13	.13½
tks ....lb.	4.35	4.50	3.00	4.50	2.65	3.05
Hoof Meal, f.o.b. Chicago unit						
Hydrogen Peroxide, 100 vol,	...	.12	...	.12	...	.12
140 lb cbys ....lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1 ..lb.	...	.42	...	.42	.40	.42
I						
Indigo, Bengal, bbls .....lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid ......lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars .lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales ...lb.	.37	.42½	.30	.42½	.25	.31
Bleached, prime, bales lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq, 17°, bbls delv ....lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride						
Nitrate, coml, bbls 100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C) drs, f.o.b. Wyandotte, Mich ....lb.	...	.23½	...	.23½	.22½	.23½
tks ....lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd ....lb.	...	.10	.076	.10	.06½	.07½
drs, frt all'd, c-l ....lb.	...	.12	.086	.12	.07½	.08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast ....ton	22.00	25.00	22.00	25.00	22.00	25.00
L						
Lead Acetate, f.o.b. NY, bbls, (PC)						
White, broken ......lb.	...	.12½	.12	.13¼	.11	.12½
cryst, bbls ....lb.	...	.12½	.12	.13¼	.11	.12½
gran, bbls ....lb.	...	.13¼	.12¾	.14	.11¾	.13¾
powd, bbls ....lb.	...	.13¼	.12¾	.14	.11¾	.13¾
Arsenate, East, drs ....lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls ..lb.	...	.22½	.19	.22½	...	.19
Metal, c-l, NY (FP) 100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls ....lb.	...	.17¾	.17¾	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ....lb.	...	.10¼	.09	.10¼	.08	.08¾
97% Pb_3O_4, delv ....lb.	...	.09½	.09¼	.09½	.084	.086
98% Pb_3O_4, delv ....lb.	...	.10½	.09½	.10½	.0865	.0885
Resinate, fused, bbls ..lb.	.10	.12	.09½	.12	.09½	.16½
Stearate, bbls ....lb.	..	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt, all'd ....lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks ....lb.	...	.07½	.06½	.07½	.06½	.07
Lecithin, ed, drs, cl .....lb.	...	.28½	.28½	.34	...	...
tech, drs, cl ....lb.	...	.26	.26	.28	...	...
Lime, chemical quicklime, f.o.b. wks, bulk ....ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks ..ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	no prices		.07½	.08½	...	.07½
drs ....gal.	no prices		.10	.14	.10	.14
Linseed Meal, bgs ......ton	no prices		33.50	36.00	23.00	33.00
Litharge, coml, delv, bbls lb.	...	.08	.079	.08	.07	.0760
Lithopone, dom, ordinary, (PC), delv, bgs .....lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls ....lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs ....lb.	...	.056	...	.056	.05¼	.056
bbls ....lb.	...	.0585	.	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls lb.	...	.14	.13	.14	.10½	.13
Solid, 50 lb boxes .... lb.	...	.23½	.22	.23½	.16½	.22

FP Full Priority. *PC* Price Ceiling. (A) Allocation.

Current

Madder
Morpholine

	Current Market		1942 Low	1942 High	1941 Low	1941 High
M						
Madder, Dutch ....lb.	.24	.30	.22	.30	.22	.25
Magnesite, calc, 500 lb bbls ton	84.00	90.00	74.00	90.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ....ton	...	32.00	...	32.00	...	32.00
Metal, Ingots, c-l ......lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ....lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ....lb.	...	.26	...	.26	...	.26
Palmitate, bbls ....lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls .....lb.	.18	.20	.18	.25	.11	.25
Stearate, bbls ....lb.	.31	.32	.31	.33	.23	.31
Manganese, acetate, drs ..lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.17	.15	.17	.15	.16
Chloride, bbls ....lb.	.14	nom.	.13	.14	...	.14
Dioxide, tech (peroxide), paper bags, c-l ......ton	...	74.75	70.00	74.75	...	71.50
Hydrate, bbls ....lb.	...	.82	...	.82	...	.82
Linoleate, liq, drs .....lb.	...	.20	.18	.20	.18	.19½
solid, precip, bbls ....lb.	...	.22	.19	.22	...	.19
Resinate, fused bbls ...lb.	.09	.10½	.08¼	.10½	.08¼	.08½
precip, drs ....lb.	.14½	.15½	.12	.15½	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs .....lb.	...	.11¼	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ....ton	...	60.00	no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ....lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ......ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal . 76 lb. flasks	...	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ....lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ....lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl ....lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ....lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ....lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd, drs, c-l, frt all'd (*PC*) ..gal.	...	.66	...	.66	.60	.66
tks, frt all'd ....gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ....gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ....gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs ....gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ....gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ....lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv .....lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv .....lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd .... gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ....gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd .....gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ....lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd ....lb.	.50	.55	.50	.55	...	.55
less than 100 lbs f.o.b. wks ....lb.	...	.60	...	.60	...	.60
Chloride, 90 lb cyl ....lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd ..lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ..lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ...lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref, l-c-l, drs, f.o.b. wks ....lb.	...	.16	...	.16	.16	.19
crude ....lb.	...	.14	...	.14	.14	.15
Monoamylamine, cl, drs, wks lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks on (100% basis) ....lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, lcl, drs, f.o.b. wks ....lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs (100% basis) c-l, wks ....lb.	...	.48	.40	.48	...	.40
l-c-l, wks ....lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks .....lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ....lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J2 bgs f.a.s. ....ton	...	65.00	no prices		35.00	48.00
J1 bgs f.a.s. ....ton	...	60.00	no prices		28.00	39.00
N						
Naphtha, vm&p, (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ....gal.	...	.27	...	.27	...	.26
drs, c-l ....gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks ....lb.	2.75	3.00	2.50	3.00	2.25	2.75
Balls, flakes, pks ......lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd, bbls, wks ..lb.	...	.08	...	.08	.07	.08
Flakes, ref'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls (A) lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls ....lb.	.18	.20	.18	.20	.18	.20
Metal ingot ....lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY ..lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs ....lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ....ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks ....lb.	.08	.09	.08	.09	.08	.09
tks ....lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks ....unit	...	3.00	2.75	3.50	2.20	3.00
dom, Western wks ...unit	...	2.90	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ...lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	...	.0385	.03½	.03¾	.03⅛	.03¾
tks ....lb.	...	.0325	.02	.0325	.02¾	.03
Octyl Acetate, tks, wks ..lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY ....lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks ....lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs ...lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks (A) .... lb.	.17½	.18	.17	.18	.16	.17½
Orthodichlorobenzene, 1000 lb drs ....lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks ....lb.	.15	.16	.15	.18	.15	.18
Orthonitroparachlorphenol, tins ....lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ....lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks ....lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl ....lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid ....lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*)						
122-127° M P ....lb.	...	.052	...	.052	.04¼	.057
128-132° M P ....lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P ....lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks ..lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb. kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ......lb.	...	.32	...	.32	...	.32
Dichlorobenzene 200 lb drs, wks ....lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) ....lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv ....lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls ....lb.	...	.70	...	.70	...	.70
tks, wks ....lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control (A) Allocation.

Current

Paris Green
Potassium Perchlorate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs, lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C,						
group, 3 tks (*PC*) . . gal.	...	.06½	.06½	.08½	...	.08½
drs, group 3 . . . . gal.	...	.11	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs,						
frt all'd (*FP*) . . . . . . lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber,						
bbls . . . . lb.	...	.03¾	...	.03¾	.02¾	.03½
White, lily, bbls . . . . lb.	...	.05¾	...	.05¾	.04¾	.05¾
White, snow, bbls . . . . . lb.	...	.06½	...	.06½	.05½	.06½
Petroleum Ether, 30-60°,						
Group 3, tks . . . . gal.	...	.16	...	.16	.13½	.16
drs, group 3 . . . . gal.	...	.18	...	.18	.14½	.18

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Cleaners naphthas, group						
3, tks, wks . . . . gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.11	.10½	.11	.10	.10½
Lacquer diluents, tks,						
East Coast . . . . gal.	...	.11	...	.11	.09½	.11
group 3, tks . . . . gal.	.07⅜	.07½	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East						
tks, wks . . . . gal.	...	.11	.10½	.11	.09	.11
Group 3, tks, wks . . gal.	...	.07⅜	...	.07⅜	.06	.07⅜
Petroleum thinner, 43-47,						
East, tks, wks . . . . . . gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks . . gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand						
grd, East, tks, wks . . gal.	...	.11	.10½	.11	.09½	.10½
Group 3, tks, wks . . gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East,						
tks, wks . . . . gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks . . . . . . gal.	...	.06⅜	...	.06⅜	.05½	.06⅜
Phenol, 250-100 lb drs . . . lb.	...	.12½	.12½	.13	.12	.13¼
tks, wks (*FP*) (A) . . . . lb.	...	.11½	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine,						
100 lb kgs . . . . lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs . . . . . lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydro-						
chloride, com . . . . lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons . . . . lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
70% basis . . . . ton	...	2.70	2.40	2.70	2.15	2.40
72% basis . . . . ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.00	2.00	2.20	1.90	2.00
75-74% basis . . . . . ton	...	4.00	. .	4.00	...	2.90
Tennessee, 72% basis ton	...	5.30	5.00	5.50	4.50	5.00
Phosphorus Oxychloride 175						
lb cyl (*FP*) . . . . lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases . . . . . . lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl . . . . lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb						
drs, wks (A) . . . . lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist . . . . lb.	.72	.74	.72	.74	.50	.65
Steam dist wat wh bbls gal.	1.00	nom	1.00	1.10	.59	.68
Pitch Hardwood, wks . . . ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks . . . . ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported . . . . lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls . . . . bbl.	...	6.00	6.00	7.00	6.00	7.00
Polyamylnaphthalene, l-c-l,						
drs, f.o.b. wks . . . . lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake . . . . lb.	...	.07	...	.07	...	.07
liquid, tks . . . . lb.	...	.02⅜	...	.02⅜	...	.02⅜
Manure Salts, Dom						
30% basis, blk . . . . unit	...	.60	...	.60	...	.60

POTASSIUM

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium Abietate, bbls . . lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb						
bbls . . . . lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725						
lb csks *(*FP*) . . . . . . lb.	...	.09⅜	...	.09⅜	.08⅞	.09⅜
Binoxalate, 30 lb bbls . . lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs . . lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800						
lb cks . . . . lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks . . . . lb.	...	.0275	...	.0275	...	.0275
drs, wks . . . . lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs,						
wks (*FP*) (A) . . . . . . lb.	nom.	.11	nom.	.11	...	.11
gran, kgs . . . . lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs . . . . lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls . . . . lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) . . lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs . . . . lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls . . . . lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls . . . . lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs,						
wks (*FP*) (A) . . . . . . lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control. (A) Allocation.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):						
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.19¾	.20¾	.19¾	.21	.19¾	.21
Prussiate, red, bbls ....lb.	.70	.75	.70	.75	no prices	
Yellow, bbls ....lb.	.17	.19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	...	.45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ....ton	...	26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	.02¾	.03¾	.02¾	.03¾	.03¾	.04
Putty, com'l, tubs ....100 lb.	...	3.15	...	3.15	...	3.15
Linseed Oil, kgs ...100 lb.	...	5.00	...	5.00	...	5.00
Pyrethrum, conc liq: (A)						
2.4% pyrethrins, drs, frt all'd ....gal.	...	5.75	4.30	5.75	4.40	4.98
3.6% pyrethrins, drs, frt all'd ....gal.	...	8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs ...lb. bgs ....lb.	.27	.28	.21	.28	.20	.25
Fine powd, bbls .....lb.	...	.23	.22	.29	.21	.26
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	...	1.71
Refined, drs ....lb.	...	.46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices		no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40

Q

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Quebracho, 35% liq tks ..lb.	...	.05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ......lb.	...	.05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	...	.04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales lb.	...	.05	...	.05	.05	.05½
Quercitron, 41 deg liq, 450 lb bbls ....lb.	...	.10	...	.10	.08½	.09½
Solid, drs ....lb.	...	.18½	.18	.18½	.11	.16½

R

	Current Market		1942 Low	1942 High	1941 Low	1941 High
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech cans ....lb.	.68	.74	.68	.74	.68	.74
Rochelle Salt, cryst ......lb.	...	.43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	...	.42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	...	.58	.48	.58	.40	.50
Sceond run ....gal.	...	.60	.50	.60	.42	.56
Third run, drs ....gal.	...	.64	.54	.64	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**						
B	...	3.75	2.96	3.90	2.06	3.55
D	...	3.85	2.73	4.05	2.08	3.55
E	...	4.00	3.06	4.09	2.07	3.62
F	...	4.05	3.27	4.13	2.08	3.59
G	...	4.07	3.52	4.13	2.18	3.52
H	...	4.07	3.53	4.13	2.27	3.50
I	...	4.10	3.53	4.13	2.26	3.50
K	...	4.13	3.56	4.14	2.36	3.01
M	...	4.16	3.66	4.16	2.38	3.68
N	...	4.17	3.67	4.17	2.47	3.71
WG	...	4.37	3.69	4.81	2.79	4.52
WW	...	4.41	3.73	5.20	3.05	4.57
X	...	4.41	3.73	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	3.25	2.08	3.25	1.31	3.00
D	...	3.30	2.31	3.40	1.51	3.00
E	...	3.35	2.41	3.44	1.60	3.07
F	...	3.39	2.62	3.47	1.62	3.04
G	...	3.39	2.87	3.47	1.60	2.97
H	...	3.39	2.88	3.48	1.63	2.97
I	...	3.40	2.88	3.48	...	2.98
K	...	3.44	2.91	3.48	1.84	3.06
M	...	3.44	3.05	3.48	2.01	3.13
N	...	3.45	3.05	3.48	2.01	3.13
WG	...	3.60	3.05	3.60	2.65	3.16
WW	...	3.65	3.06	3.65	2.76	3.97
X	...	3.65	3.10	3.65	2.96	4.02
Rotten Stone, bgs mines ton	25.00	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ...lb.	no prices		no prices		no prices	
Powdered, bbls ......lb.	no prices		no prices		no prices	

S

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sago Flour, 150 lb bgs ..lb.	.05	.05¾	.04¾	.05¾	.03½	.05½
Sal Soda, bbls wks ...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	...	15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ......ton	...	16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	...	.082	...	.082	.076	.082
Cryst, bbls ....lb.	...	.092	...	.092	.086	.092
Powd, bbls ....lb.	...	.092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¾	.01½	.01¾	.01½	.01¾	.01½
Schaeffer's Salt, kgs .....lb.	...	.46	...	.46	...	.46

**Jan. 30, 1941, high and low based on 280 lb. unit. Nov. 30 prices.
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation.

Current

Shellac
Sodium Sulfite

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls . . lb. *s*	. . .	.42½	.39	.42½	.26	.40‡
Garnet, bgs . . . . lb.	. . .	.389	.37	.39	.20	.39
Superfine, bgs . . . . lb. *s*	. . .	.366	.32	.366	.16½	.34
T. N., bgs . . . . lb. *s*	. . .	.355	.31	.355	.16	.33
Silver Nitrate, vials . . . . . oz.	. . .	.32⅛	.26⅞	.32⅛	.24	.26⅞
Slate Flour, bgs, wks . . . . ton	11.00	12.00	9.00	12.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks . . . . 100 lb.	. . .	1.15	. . .	1.15	. . .	1.15
58% light, bgs . . . . 100 lb.	1.05	1.13	1.05	1.13	1.05	1.08
blk . . . . 100 lb.	. . .	.90	. . .	.90	. . .	.90
paper bgs . . . . 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls . . . . 100 lb.	. . .	1.35	. . .	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs . . . . 100 lb.	. . .	2.70	. . .	2.70	. . .	2.70
76% solid, drs . . . . 100 lb.	. . .	2.30	. . .	2.30	. . .	2.30
Liquid sellers, tks . . 100 lb.	. . .	2.00	. . .	2.00	. . .	2.00
SODIUM						
Sodium Abietate, drs . . . . lb.	. . .	.11	. . .	.11	. . .	.11
Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks . . . . lb.	. . .	.05	. . .	.05	.04	.06
90%, bbls, 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv . . . . . lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs . . . . lb.	. . .	.79	.69	.79	.39	.73
Antimoniate, bbls . . . . . lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs . . . . lb.	. . .	.08	. . .	.08	.07	.08¼
Arsenite, liq, drs . . . . . gal.	. . .	.35	. . .	.35	. . .	.35
Dry, gray, drs, wks . . lb.	. . .	.08½	.06¼	.08½	.06½	.09¼
Benzoate, USP kgs . . . . lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks . . . . 100 lb.	. . .	1.85	1.70	1.85	. . .	1.70
Bichromate, 500 lb cks, wks* (*FP*) . . . . lb.	. . .	.07⅛	. . .	.07⅛	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% solbbls, wks 100 lb.	1.35	1.80	1.35	1.80	1.40	1.80
Chlorate, bgs, wks (A) lb.	. . .	.06¼	. . .	.06¼	. . .	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks . . . . . lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv . . . . lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks . . . . lb.	. . .	.08	. . .	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks . . . . lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.75	3.00	2.75	3.00	. . .	2.80
Tech, reg cryst, 375 lb bbls, wks . . . . 100 lb.	. . .	2.45	. . .	2.45	. . .	2.45
Iodide, Jars . . . . lb.	. . .	2.42	. . .	2.42	. . .	2.42
Metanilate, 150 lb bbls lb.	. . .	.40	. . .	.40	.41	nom.
Metasilicate, gran, c-l, wks . . . . 100 lb.	. . .	2.50	. . .	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	. . .	3.05	. . .	3.05	. . .	3.05
Anhydrous, wks, c-l, drs . . . . 100 lb.	. . .	4.00	. . .	4.00	3.75	4.00
wks, lcl, drs . . 100 lb.	. . .	5.05	. . .	5.05	5.05	5.05
Monohydrated, bbls . . . . lb.	. . .	.03	.026	.03	.023	.026
Naphthenate, drs . . . . . . lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	. . .	.50	. . .	.50	. . .	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY (A) . . . ton	. . .	29.35	. . .	29.35	28.70	29.35
100 bgs, same basis ton	. . .	30.05	. . .	30.05	29.40	30.05
Bulk . . . . ton	. . .	27.00	. . .	27.00	. . .	27.00
Nitrite, 500 lb bbls . . . . lb.	. . .	.06¾	. . .	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l, anhyd . . . . lb.	. . .	.04½	.04½	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, c-l, f.o.b. wks . . . . lb.	. . .	.0315	.03	.0315	.0285	.03
Perborate, drs, 400 lb . . lb.	. . .	.14¾	. . .	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb . . lb.	. . .	.17	. . .	.17	. . .	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks . . . . . . 100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb bbls, wks . . . . . 100 lb.	. . .	2.90	2.90	3.05	2.45	3.05
bgs, wks . . . . . . 100 lb.	. . .	2.70	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs . . lb.	. . .	.65	. . .	.65	. . .	.65
Prussiate, Yellow, 350 lb bbls, wks . . . . lb.	. . .	.11	. . .	.11	.10½	.11
Pyrophosphate anhyd, 100 lb bbls, f.o.b. wks, frt eq lb.	.0528	.0610	.0528	.06	.0510	.0610
Sesquisilicate, drs, c-l, wks . . . . 100 lb.	. . .	3.05	. . .	3.05	. . .	3.05
Silicate, 60°, 55 gal drs, wks . . . . 100 lb.	. . .	1.70	. . .	1.70	. . .	1.70
40°, 55 gal drs, wks 100 lb.	. . .	.80	. . .	.80	. . .	.80
tks, wks . . . . . . 100 lb.	. . .	.65	. . .	.65	. . .	.65
Silicofluoride, 450 lb bbls NY . . . . lb.	.09	.14½	.09	.15	.09¾	.15
Stannate, 100 lb drs . . lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls . . . . lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks . . . . 100 lb. *t*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 30% cryst, 440 lb. bbls, c-l, wks . . . . . . lb.	. . .	.024	. . .	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks . . . . lb.	. . .	.0315	. . .	.0315	.03	.03¼
Sulfite, powd, 400 lb bbls wks . . . . lb.	. . .	.05¼	. . .	.05¼	. . .	.05¼

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Feb. 28. (*PC*) Price Control. (A) Allocation.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sodium (continued):						
Sulfocyanide, drs ......lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls ...lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	
Sorbitol, drs, wks ....lb.	...	.17¾	...	.17¾	.14¼	.17¾
Spruce, Extract, ord, tks lb.	...	.01½	.01¼	.01½	.01⅛	.01¼
Ordinary, bbls ....lb.	...	.02⅝	.01¼	.02⅝	.01⅜	.01¾
Super spruce ext, tks ..lb.	...	.01½	...	.01½	.01⅛	.01½
Super spruce ext, bbls lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs ....ol	...	.04½	.04	.04½	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs ..100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs ....lb.	...	.0637	.061	.0637	.04½	.0585
Imp, bgs ....lb.	no prices		no prices		no prices	
Rice, 200 lb bbls ......lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant .....100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs .....lb.	...	.05	...	.05	..	.05
Strontium, carbonate, 600 lb bbls, wks ....lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY lb.	.07¼	.08¾	.07¼	.08¾	.07¼	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ......lb.	...	.45	...	.45	...	.45
tech, bbls, wks, ...lb.	...	.40	...	.40	...	.40
SULFUR						
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	..	16.00
Flour, com'l, bgs ..100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls ....100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs 100 lb.	...	2.20	2.05	2.20	...	2.05
bbls ....100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs ....100 lb.	...	2.35	..	2.35	..	2.35
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ......100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls ....100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs ....100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls ....100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks ....lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.08	.07	.09	.07	.09
Multiple units, wks ...lb.	.04½	.06	.04½	.07	.04½	.07
tks, wks ....lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks lb.	.13	.21	.13	.40	.16	.40
Multiple units, wks ....lb.	...	.06½	.06½	.10	.07½	.10
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	no prices		no prices		no prices	
Extract, 42°, bbls .....lb.	...	.08	.06¼	.08	.06	.08
Superphosphate, 16% bulk, wks ....ton	10.10	10.74	10.10	10.80	8.50	10.00
Run of pile ....ton	9.60	10.24	9.60	10.24	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.85	.80	.85	.68	.80
T						
Talc, crude, 100 lb bgs, NY ton	12.50	24.50	12.50	24.50	14.00	16.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Tankage, Grd, NY ....unit *u*	...	4.60	4.25	4.85	2.35	4.10
Ungrd ....unit *u*	...	5.10	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo unit *u*	...	5.53	5.60	5.90	2.35	5.60
South American cif unit *u*	...	nom.	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs ....lb.	.04¼	.07¼	.04	.07¼	.03	.06¾
Tar Acid Oil, 15%, drs gal.	...	.27½	...	.27½	.22	.24
25% drs (A) ....gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs ....gal.	...	.33	.32½	.33	.26	.29
tks, delv, E. cities ....gal.	...	.24½	.24	.24½	...	.22
Tartar Emetic, tech, bbls lb.	...	.47¾	...	.47¾	.36¼	.47¾
USP, bbls ....lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks lb.	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*) (A) ..lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks ......lb.	...	.55	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks ....lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls (*PC*) ....lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls ..lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls ....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*) (A) ....gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*) ....gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ....lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs ....lb.	...	1.01	...	1.01	...	1.01

(*FP*) Full Priority. (A) Allocation.

Current

Tributylamine
Zinc Chloride

	Current	Market	1942 Low	1942 High	1941 Low	1941 High
Tributylamine, lcl, drs, f.o.b. wks . . . lb.	...	.81	.	.81	...	.81
Tributyl citrate, drs, frt all'd lb.	...	.34	.24	.34	.24	.26
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	*(FP)*	.08	...	.08	.08	.09
Tricresyl phosphate, tech, *(FP)* . . . lb.	.25	.31	.25	.31	.22	.36½
Triethanolamine, 50 gal drs, wks . . . lb.	...	.19	...	.19	...	.19
tks, wks . . . lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks . . . lb.	..	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls . . . lb.	...	.30	...	.30	...	.30
Stearate bbls . . . lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. . . . lb.	.54	.56	.54	.56	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi . . . lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine . . . lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs *(FP)* . . . lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated bgs, wks ton	...	21.50	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls . . . gal.	...	.78	.69¼	.82½	.45	.83
Savannah, bbls* . . . gal.	...	.63½	.55¼	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY . . . gal.	...	.64	.61	.80	.35	.76
tks, delv E. cities . . gal.	...	.59	.56	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities . . . gal.	.55	.58	.55	.70	.35	.65
tks, delv E. cities . . gal.	...	.50	.50	.58	...	...
U						
Urea, pure 112 lb cases . . lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c.i.f. S.A. points . . . ton	no prices		no prices		no prices	
Dom f.o.b., wks . . . ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq, nitrogen basis . . . ton	...	121.58	...	121.58	...	121.58
V						
Valonia beard, 42%, tannin bgs . . . ton	no prices		no prices		no prices	
Cups, 32% tannin bgs ton	no prices		no prices		no prices	
Extract, powd, 63% . . . lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots . . . lb.	...	2.60	2.00	2.60	...	2.60
Ex-guaiacol . . . lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin . . . lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs . . lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs . . . ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls lb.	.04475	.046	.04475	.0475	.03⅞	.05
Wax, Bayberry, bgs . . . lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases . . . lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs lb.	...	.49	...	.49	.30	.47
Brazilian, bgs . . . lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs . . . lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs . . . lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs . . . lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs . . . lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs . . . lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs . . . lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs . . . lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases . . . lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs . . . lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases . . . lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs . . . ton						
bgs, c-l, wks . . . ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks . . ton	20.00	24.00	16.00	24.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks . . . gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks . . . lb.	...	.25	.20	.25	...	.20
Zinc Acetate, tech, bbls, lcl, delv . . . lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks . . . lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(FP) Full priority. *(PC)* Price Ceiling. Nov. 30 price.

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued):						
Cyanide, 100 lb drs ....lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000 lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis ....100 lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks lb.	...	.07¼	...	.07¼	.06¼	.07¼
Palmitate, bbls ....lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls lb.	.11	.12	.10	.12		.10
Stearate, 50 lb bbls ....lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks ....lb.	...	.360	.360	.365	.315	.365
Flake, bbls ....lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv lb.	...	.08½	.08	.08½	...	.08
bgs, delv (*PC*) .....lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs lb.	.24	.25	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Babassu, tks, futures ....lb.	...	.111	no prices		...	.06
Castor, No. 3. 400 lb drs lb.	...	.13¼	.12½	.13¼	.0180	.12½
(A) (*PC*) Blown, 400 lb drs ....lb.	...	.15¼	.14	.15¼	.11¼	.14
China Wood, drs, spot NY lb.	...	.39	.39	.40⅛	.27¼	.37¼
tks, spot NY ....lb.	...	.3875	.3875	...	.26¼	.35½
Coconut, edible, drs NY ..lb.	...	.0985	...	...	.08	.15½
Manila, tks, NY ......lb.	...	.0835	...	...	.03⅜	.10
tks, Pacific Coast ....lb.	no prices		no prices		...	.03¼
Cod, Newfoundland, 50 gal bbls ....gal.	...	.90	.85	.90	.07½	.80
Copra, bgs, NY ....lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills ...lb.	.12¼	nom.	.12½	.12¼	.06⅜	.13
Refd, 375 lb bbls, NY lb.	.15½	nom.	.15	.15½	.14¼	.16
Degras, American, 50 gal bbls, NY ....lb.	.12½	nom.	.11½	.12½	.07½	.08¼
Greases, Yellow ....lb.	...	.0929	...	.0929	.04¼	.08½
White, choice, bbls, NY lb.	...	.097	.	.097	.05	.09
Lard, Oil, Edible, prime lb.	...	.16	.15½	.16	.08½	.14½
Extra, bbls ....lb.	...	.15¼	.15	.15¼	.08¼	.13¼
Extra, No. 1, bbls ....lb.	...	.14½	.14½	.14⅝	.08	.13¼
Linseed, Raw less than 5 drs lots ....lb.	...	.145	.125	.149	.091	.123
drs, c-l, spot ....lb.	.135	.137	.117	.143	.095	.190
tks ....lb.	.126	.128	.108	.134	.084	.1060
Menhaden, tks, Baltimore gal.	...	.089	.63¼	.666	.30	.60*
Refined, alkali, drs ....lb.	.127	.129	.12	.129	.084	.122
Kettle boiled, drs .....lb.	.137	.139	.13	.139	.096	.132
Light pressed, drs .....lb.	.117	.119	.11	.139	.082	.112
tks ....lb.	.109	.11	.102	.11	.072	.10
Neatsfoot, CT, 20°, bbls, NY lb.	nom.	.25¼	...	.25¼	.18¼	.26½
Extra, bbls, NY ......lb.	nom.	.14⅞	...	.14⅞	.08¼	.14
Pure, bbls, NY ....lb.	nom.	.19¼	.17¼	.19¼	.12¼	.17¼
Oiticica, bbls ....lb.	.23	.25	.29	.25	.16½	.23½
Oleo, No. 1, bbls, NY ...lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY ......lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY ..gal.	3.50	4.00	3.50	4.50	2.25	4.25
Edible, bbls, NY .....gal.	4.00	4.25	4.00	5.50	4.75	5.30
Foots, bbls, NY ....lb.	.19	nom.	.19	.20	.10¼	.19
Palm, Kernel, bulk ......lb.	no prices		no prices		no prices	
Niger, cks ....lb.	...	.0825	.0925	...	.04¼	.09
Sumatra, tks ....lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill ..lb.	...	.13	.12⅞	.13	.05¼	.16
Refined, bbls, NY ....lb.	.17	nom.	.16¼	.17	.08	.16
Perilla, drs, N Y (A) ...lb.	...	.246	...	.246	.18	.23
tks, Coast ....lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem Sec.						
Rapeseed, blown, bbls, NY lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY ..gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs ......lb.	.11¼	.13½	.11¼	.143	.07¼	.13
tks ....lb.	.11	.11¼	.11	.12½	.06¼	.11½
Sardine, Pac Coast, tks ..gal.	.0890		.66½	nom.	.39	.62½*
Refined alkali, drs ....lb.	.127	.129	.12	.129	...	...
Light pressed, drs .....lb.	.117	.119	.11	.119	.084	.122
tks ....lb.	.109	.11	.102	.11	.078	.112
Soy Bean, crude						
Dom, tks, f.o.b. mills ..lb.	.12¼	nom.	.12¼	nom.	.05⅜	.12¼
Crude, drs, NY .....lb.	.13	...	.13	nom.	.06¼	.12¼
Ref'd, drs, NY ....lb.	.14¼	nom.	.14¼	nom.	.05½	.12¼
tks ....lb.	.13½	nom.	.13½	nom.	.07⅜	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY (A) lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs ....lb.	.14	.15¼	.14	.16½	.09½	.13¼
Double pressed saponified bgs ....lb.	.15¼	.16¼	.15¼	.16¼	.09¼	.14
Triple pressed dist bgs lb.	.17	.18¼	.17	.19½	.12½	.16½
Stearine, Oleo, bbls .....lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks ton	...	55.00	40.00	55.00	...	...
tks, wks ....ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv .....lb.	...	.05	.04	.05	...	...
tks, wks ....lb.	...	.04½	.03½	.04½	...	...
Tallow City, extra loose ..lb.	...	.097¼	...	.097¼	...	.07½
Edible, tierces ....lb.	no prices		no prices		...	.05½
Acidless, tks, NY .....lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs ..lb.	...	.08¼	...	.08¼	.06½	.08¼
Double bbls ....lb.	...	.12	...	.12	.09½	.11
Whale:						
Winter bleach, bbls, NY lb.	...	.1110	...	.1110	..099	.1110
Refined, nat, bbls NY ..lb.	...	.1070	...	.1070	.095	.1070

(*FP*) Full Priority. (*PC*) Price Control. (A) Allocation.
* Previous prices were on gallon basis.

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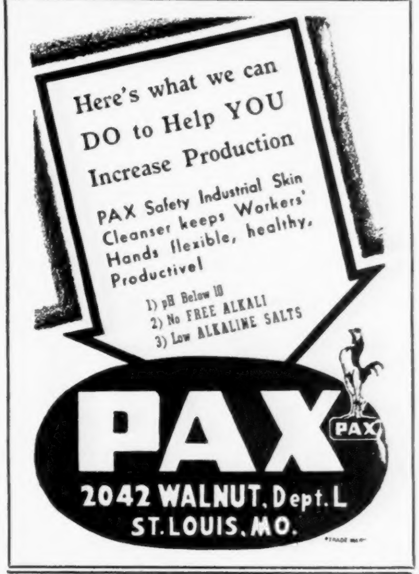

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Index to Advertisers

Index to Advertisers

"WE"-EDITORIALLY SPEAKING

The staff of CHEMICAL INDUSTRIES wishes you and yours a Joyous and Merry Christmas and a Happy and Prosperous New Year. While the road ahead is still full of uncertainties, the outlook is much brighter than it was a year ago. America has proven conclusively that it can meet any crisis with its chin up, with great fortitude and with a ready willingness to make every sacrifice necessary to preserve the ideals of democracy. The war with all its horrors has again brought home the lesson to each and every one of us that "Not by bread alone does man live."

The consulting Editorial Board of CHEMICAL INDUSTRIES this month celebrates the fifteenth year of its existence and on this special birthday the editors of this publication wish to take this opportunity of expressing their deep appreciation of the valuable services rendered by these men who serve without any monetary reward. They have very unselfishly given their time and energies with but one purpose in mind—to render a public service to the readers of this publication and, in so doing, to assist the industry they are so very proud of.

Of the ten who composed the original board of fifteen years ago four are still very active members—Robert T. Baldwin, Benjamin T. Brooks, C. R. Downs and William N. Grosvenor; three have passed through the great adventure—Arthur D. Little, John E. Teeple and Theodore B. Wagner. Charles H. MacDowell is now enjoying a well-deserved retirement after many years of distinguished service; Milton C. Whitaker who retired from the Board in January of this year has been a constant guide and friend of the editors; and Frank C. Whitmore while not officially a member of the Board for several years, never hesitates to criticize constructively when he feels it necessary or advisable to do so, and by the same token, to give a "pat on the back" when he thinks something accomplished was particularly worthy of commendation.

During the past fifteen years several outstanding industrialists and technologists have accepted invitations to join this unique body and its present membership consists, in addition to the four already mentioned, of the following: L. W. Bass, J. V. N. Dorr and Walter S. Landis. Our little celebration of this special event is saddened by the recent death of Frederick M. Becket who served with distinction for many years.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

Well, at long last the WPA is dead. It is, indeed, a sad commentary on a great many things that it took a global war to bring on its demise.

Each succeeding day is adding to the reputation of William M. Jeffers, czar of the rubber situation. It is refreshing as well as reassuring to have an executive in that important post who is not afraid to tell the country the true picture regardless of political expediencies. The program in synthetic rubber production is highly encouraging, but we will not get and should not expect any miracles.

Fifteen Years Ago

(From the pages of December, 1927)

***Chemical Markets* (former publication title of *Chemical Industries*) will become as of January 1, 1928, a monthly magazine instead of a weekly newspaper.**

Dr. William H. Nichols presents the new Nichols Chemistry building to N. Y. U.

C. R. Downs is elected chairman of the N. Y. Section of the A. C. S.

Prof. Moses Gomberg, University of Michigan, announced as the next recipient of the Chandler Medal.

H. W. Hamilton of White Tar is elected president of the insecticide and disinfectant manufacturers' group.

Germany is said to be turning out 580,000 metric tons of fixed nitrogen annually.

I. G. and Kuhlman interests sign Franco-German dyestuffs agreement.

Tacoma Electrochemical, subsidiary of Penn Salt, Incorporated, to make chlorine.

Those who attended the luncheon last month at the Hotel New Yorker in New York given by Hal W. Johnston, a director of the Packaging Institute, were certainly given the surprise of their lives when after the delightful repast was over they were informed that every item on the menu was a dehydrated product. You certainly couldn't convince the guests present that dehydrated foods haven't a very bright post-war outlook. And to add just a little more proof—the members of the C.I. staff in attendance at the recent National Chemical Exposition were not at all backward in copiously sampling the dehydrated orange juice available in the next booth to ours and we have just discovered that one of the staff tried out the dehydrated egg samples and reports—"It certainly tastes like a hen had something to do with it."

It was hardly necessary for any news agency to announce Mrs. Roosevelt's return. The best tip-off was the sudden drive for a $25,000 limitation on all incomes regardless of source.

The recent meeting of the chemical engineers in Cincinnati set an attendance record despite the absence of a ladies' program. Attendance at the Power Show in New York was higher than the 1940 figure, while the 2nd National Chemical Exposition, sponsored by the Chicago Section of the A. C. S., proved to be a success despite the difficulties of travel and the necessity of moving the Show almost at the last minute from the Hotel Stevens to the Sherman. All this, we believe, proves the value of technical meetings in wartime providing the programs are well planned and tie into the war effort. We have but one criticism to offer of the Chicago chemical show. It has been proven beyond the shadow of a doubt that Sunday is definitely not a day to open a chemical exposition.

On December 2 the national debt passed the 100 billion mark. If we may be permitted to paraphrase a little—"Billions for offense, but not one cent for boondoggling."

State of Chemical Trade

Current Statistics (November 30, 1942)—p. 117

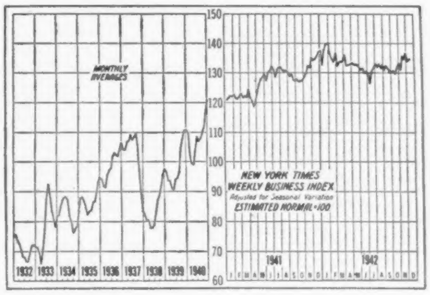
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1942	Carloadings 1941	Carloadings % of Change	Electrical Output* 1942	Electrical Output* 1941	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Nov. 7	829,490	873,582	— 5.1	3,761,961	3,368,690	+11.7	104.5	120.7	146.9	117.4	115.3	130.4	96.2	99.6	131.2	108.4
Nov. 14	826,601	883,890	— 6.5	3,775,878	3,347,893	+12.8	104.6	120.7	147.0	117.5	115.3	130.4	99.5	99.6	135.7	108.5
Nov. 21	836,427	799,386	+ 4.6	3,795,361	3,247,938	+16.9	104.6	127.6	147.0	117.5	115.3	130.5	99.5	98.7	134.3	108.5
Nov. 28	743,533	866,180	—14.2	3,766,381	3,339,364	+12.8	104.6	127.6	147.0	117.5	115.3	130.6	99.5	98.3	136.7	108.5

MONTHLY STATISTICS

CHEMICAL:	Sept. 1942	Sept. 1941	Aug. 1942	Aug. 1941	July 1942	July 1941
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available		......	......	......	......
Consumpt. in mfr. fert.	......	......	......	......	......	......
Stocks end of month	......	......	......	......	......	......
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	No Longer Available		......	......	......	......
Comp. denat. prod., wine gal...	......	......	......	......	......	......
Removed, wine gal.	......	......	......	......	......	......
Stocks end of mo., wine gal...	......	......	......	......	......	......
Spec. denat. prod., wine gal. ..	......	......	......	......	......	......
Removed, wine gal.	......	......	......	......	......	......
Stocks end of mo., wine gal...	......	......	......	......	......	......
Ammonia sulfate prod., tons *a*..	No Longer Available		......	......	......	......
Benzol prod., gal. *b*	No Longer Available		......	......	......	......
Byproducts coke, prod., tons *a*..	....	....	......	......	5,312,197	5,019,600
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	......	......	......	......	......	......
Sheets, ship., lbs.	......	......	......	......	......	......
Rods, prod., lbs.	......	......	......	......	......	......
Rods, ship., lbs.	......	......	......	......	......	......
Tubes, prod., lbs.	......	......	......	......	......	......
Tubes, ship., lbs.	......	......	......	......	......	......
Cellulose acetate, sheets, rods, tubes						
Production, lbs.	......	......	......	......	......	......
Shipments, lbs.	......	......	......	......	......	......
Molding comp., ship.; lbs. ..	......	......	......	......	......	......
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available		......	......	......	......
Production, synthetic, gals. ...	......	......	......	......	......	......
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	......	......	2,775,381	4,357,029	2,390,381	4,297,069
Heavy goods, ship., linear yds..	......	......	1,872,926	3,345,544	3,809,534	3,132,999
Pyroxylin spreads, lbs. *c*	......	......	4,202,140	7,142,042	4,771,353	6,886,395
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*..	Exports and Imports No Longer Available					
Crude sulfur *d*	......	......	......	......	......	......
Coal-tar chemicals *d*	......	......	......	......	......	......
Industrial chemicals *d*	......	......	......	......	......	......
Imports						
Chemicals and related prod. *d*..	......	......	......	......	......	......
Coal-tar chemicals *d*	......	......	......	......	......	......
Industrial chemicals *d*	......	......	......	......	......	......
Employment (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	163.4	147.6	159.9	143.1	156.7	140.0
Other than petroleum	170.6	152.5	166.0	146.7	162.2	140.4
Chemicals	193.2	182.4	194.4	180.1	195.2	175.9
Explosives	No Longer Available		......	......	......	......
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	246.0	188.5	237.4	181.5	230.8	173.6
Other than petroleum	260.6	195.4	252.2	188.4	244.4	178.6
Chemicals	307.4	250.9	309.1	247.2	313.4	239.6
Explosives	No Longer Available		......	......	......	......
Price index chemicals*	96.3	96.5	96.3	96.5	96.5	87.3
Drugs & Pharmaceuticals* ...	128.9	129.1	129.0	129.1	129.1	100.0
Fert. mat.*	78.2	78.5	78.3	78.4	82.8	74.0
Paint and paint mat.	100.4	100.7	100.1	100.3	100.7	91.6
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	Exports and Imports No Longer Available					
Total phosphate rock	......	......	......	......	......	......
Total potash fertilizers	......	......	......	......	......	......
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	......	......	......	......	......	......
Sodium nitrate	......	......	......	......	......	......
Total potash fertilizer	......	......	......	......	......	......

INDUSTRIAL TRENDS



Business: As the year comes to a close industrial and business activity are still expanding over the high rates that have been maintained for many months. The rapid growth in production of war material has more than offset the declines in regular civilian industries. Industrial production during the past year increased at about the same rate as the previous year and has been pretty much in line with forecasts and expectations.

The Federal Reserve Board's seasonally adjusted index of industrial production rose three points in October to 188. Gains in armament accounted for most of the increase. It is estimated that currently well over 50% of industrial output is for war purposes. In lines producing durable goods about 80% of output now consists of products essential to war program.

Steel: In October an all-time record was established in steel production when 7,584,000 tons were produced and the production rate expanded to 100% of capacity. In the first half of November output declined somewhat to about 99%, because of need for some furnace repairs.

Although war requirements continue to take all the steel being produced there is a downward trend to backlogs as some back orders are cancelled and "phantom" business begins to disappear from the books. Because of W.P.B.'s program of curbing construction on finished goods, the demand for structural and reinforcing steel is dropping. This saved capacity can now be diverted to other needs such as the rubber and railroad industries, etc.

State of Chemical Trade

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Carloadings: Shipments by railroad freight were maintained in large volume during October but declined seasonally about 5.3% during November.

Electric Output: According to the Edison Electric Institute output for week ending Dec. 12 set an all-time record of 3,937,524,000 kilowatt hours. This was an increase of 13.3% over the corresponding week a year ago. The industry's greatest test comes in December when short daylight hours and holiday shopping combine to keep homes and businesses lighted. To this combination, this year, is added the all-out industrial demand. Because of this demand it is expected that, for the first time in history, the weekly production of electrical energy will reach 4 billion kilowatt hours. However, the industry does not expect a crisis and is confident that the demand will be met with a comfortable margin unless some unusual combination of breakdowns occur.

Construction: Total valuation of construction contracts awarded during November in the 37 eastern states amounted to $654,184,000, according to F. W. Dodge Corp. This compares with $454,620,000 in November last year and $780,396,000 in October, 1942.

Non-residential building valuation of $256,513,000 was $116,478,000 or 60% below October, due almost entirely to the decline in the manufacturing building classification. Minor decreases of only a few per cent were shown in residential and heavy engineering groups.

Retail Trade: Department store sales increased in October and the Federal Reserve Board's seasonally adjusted index rose to 129% of the 1923-25 average as compared with 123 in September. In first half of November sales increased further and were 17% larger than in the corresponding period last year, reflecting in part price advances of about 10%.

The Census Bureau estimates that sales of independent retailers in November were 7% higher than during same month last year, but 9% lower than in October.

Commodity Prices: According to the Federal Reserve Board retail food prices continued to advance sharply from middle of September to middle of October and further increases are expected in November. Prices of most other goods and services increased slightly in this period.

MONTHLY STATISTICS (cont'd)

FERTILIZER, (Cont'd)	Sept. 1942	Sept. 1941	Aug. 1942	Aug. 1941	July 1942	July 1941
Superphosphate e (Nat. Fert. Association)						
Production, total	......	......	413.396	324,626	391,146	317,712
Shipments, total	......	......	378,196	223.978	196.424	173,000
Northern area	......	......	249,914	127,262	112,036	95,247
Southern area	......	......	128,282	96,716	84,388	77,753
Stocks, end of month, total	......	......	......	......	1,194,810	1,137,459
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	231,427	204,039	212,238	180,437	......	68,239
Total, 12 southern	176,033	135,239	66,054	71,662	......	58,009
Total, 5 midwest	61,394	68,800	146,184	108,775	......	10,230
Fertilizer employment *i*	110.0	110.2	97.5	89.6	93.8	88.5
Fertilizer payrolls *i*	137.3	111.6	121.0	90.8	118.4	87.0
GENERAL:						
Acceptances outst'd'g *f*	......	......	......	......	......	......
Coal prod., anthracite, tons	......	......	......	......	......	......
Coal prod., bituminous, tons	......	......	......	......	......	......
Com. paper outst'd'g *f*	......	......	......	......	......	......
Failures, Dun & Bradstreet	......	......	......	......	......	......
Factory payrolls *i*	220.5	162.6	214.7	133.1	142.2	152.5
Factory employment *i*	148.2	135.2	145.9	158.1	204.3	133.2
GENERAL MANUFACTURING:						
Automotive production	No Longer Available		......	......	......	......
Boot and shoe prod., pairs	38,586,091	45,464,736	38,586,091	45,464,736	45,236,650	39,779,598
Bldg. contracts, Dodge *i*	......	......	......		......	......
Newsprint prod., U. S. tons	77,962	78,657	......	83,592	76,952	83,199
Newsprint prod., Canada, tons.	257,618	298,276	......	293,054	241,178	293,483
Glass containers ,gross‡	......	......	6,584	6,791	5,945	6,291
Plate glass prod., sq. ft.	4,742,000	14,905,000	3,863,000	14,125,000	4,194,000	12,463,000
Window glass prod., boxes	......	......	1,075,343	1,267,472	......	......
Steel ingots prod., tons	7,067,084	6,811,754	7,233,451	6,997,496	7,148,824	6,812,224
% steel capacity	96.5	96.3	95.4	95.6	94.5	93.3
Pig iron prod., tons	No Longer Available		......	......	......	......
U.S. cons'pt. crude rub., lg. tons	No Longer Available		......	......	......	......
Tire shipments	No Longer Available		......	......	......	......
Tire production	No Longer Available		......	......	......	......
Tire inventories	No Longer Available		......	......	......	......
Cotton consumpt., bales	966,149	......	925,089	872,035	955,041	928,943
Cotton spindles oper.	22,956,224	22,977,528	22,973,572	23,029,066	23,109,576	23,037,818
Wool consumption *s*	48.4	......	49.9	53.5	56.5	53.3
Rayon deliv., lbs.	......	......	38,100,000	37,300,000	......	39,400,000
Rayon employment *i*	310.6	327.0	307.3	329.3	309.1	327.1
Rayon payrolls *i*	402.5	374.3	400.4	368.2	392.6	367.0
Soap employment *i*	84.7	98.2	81.6	97.4	135.1	96.2
Soap payrolls *i*	134.1	139.6	125.5	83.4	121.7	135.1
Paper and pulp employment *i*	118.8	128.4	119.5	127.8	162.7	126.1
Paper and pulp payrolls *i*	163.6	163.0	165.1	121.5	162.3	157.1
Leather employment *i*	88.8	97.0	88.3	94.8	90.8	95.3
Leather payrolls *i*	117.3	114.2	116.7	109.0	123.8	108.7
Glass employment *i*	119.1	130.3	117.9	130.0	115.0	128.8
Glass payrolls *i*	151.9	160.5	157.3	155.4	143.3	149.7
Rubber prod. employment *i*	107.4	111.5	105.1	111.8	101.3	111.4
Rubber prod. payrolls *i*	157.6	134.8	154.0	138.8	145.6	135.4
Dyeing and fin. employment *i*	129.2	136.0	127.1	136.3	128.0	139.6
Dyeing and fin. payrolls *i*	151.4	135.7	148.3	132.5	145.0	134.5
MISCELLANEOUS:						
Gasoline prod., *p*	......	......	......	......	......	56,987
Cottonseed oil consumpt., bbls.	......	......	......	......	239,933	320,947
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$43,027,934	$50,363,488	$41,105,740	$48,646,514	$42,220,566	$48,980,308
Trade sales (580 estabts.) dollars	$20,539,579	$25,624,958	$20,187,334	$23,893,291	$20,813,396	$24,274,619
Industrial sales, total, dollars	$17,242,815	$19,799,134	$16,748,036	'20,246,764	$17,173,192	$20,132,508
Paint & Varnish, employ. *i*	125.6	143.9	125.6	144.8	126.2	145.9
Paint & Varnish, payrolls *i*	163.6	169.9	162.8	171.5	161.6	174.1

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940.

Amer. Agric. Chem. Earns $167,518

American Agricultural Chemical Co. of Delaware and subsidiaries report for the quarter ended October 1, 1942, a net profit of $167,518 after depreciation, depletion, taxes, etc., equal to 26 cents a share on 627,969 shares of capital stock.

This compares with $195,622 or 31 cents a share for quarter ended October 2, 1941.

NOPCO Nets $431,834

National Oil Products Co. and subsidiaries report for the nine months ended September 30, 1942, a net profit of $431,834 after charges and federal income and excess profits taxes, equal to $2.00 a share on the 214,794 shares of capital stock.

This compares with a revised net profit of $635,774, or $2.95 a share for the first nine months of 1941.

Federal income and excess profits taxes for the nine months amounted to $672,850 against $726,253 in the like 1941 period.

Interchemical Pays $1.64

Interchemical Corp. and wholly-owned subsidiaries in a report for the nine months ended September 30, 1942, subject to audit, show a net profit of $770,411 after depreciation, provision of $540,000 for federal income taxes and $560,000 for excess profits taxes. The above net is equal after dividend requirements on 6% preferred stock, to $1.64 a share on 290,320 no-par shares of common stock.

The report states the provisions for federal income and excess profits taxes are based on the Revenue Act of 1942, without giving effect to any reductions in taxes which may result from post-war excess profits tax credits or from the relief and other special provisions of the Act which may be applicable to certain subsidiaries.

This compares with a net profit of $1,239,346, equal to $3.26 a share on common for the nine months ended September 30, 1941. Federal income taxes for this period amounted to $602,000 and excess profits taxes were $542,000.

Current assets as of September 30, 1942, including $3,365,220 cash, amounted to $12,307,782 and current liabilities were $3,515,894. This compares with cash of $1,930,336, current assets of $12,202,507 and current liabilities of $4,478,062 on September 30, 1941. Inventories were $6,430,192 against $6,406,388.

Earnings Statements Summarized

Company:	Net income 1942	Net income 1941	Common share earnings 1942	Common share earnings 1941
American Cyanamid Co.—Nine months, Sept. 30	$3,288,023	$4,585,856	$1.10	$1.63
Diamond Match Co.—Nine months, Sept. 30	1,515,119	1,499,484	1.20	1.18
Dow Chemical Co.—August 31 quarter	2,147,705	2,104,282	h1.66	h1.79
Kellogg & Sons, Inc., Spencer—Year Aug. 29	1,349,658	1,861,866	2.65	3.66
Reynolds Metals Co.—Nine months, Sept. 30	733,957	2,293,040	.52	2.04
Sherwin-Williams Co. of Canada—Year Aug. 31	641,867	573,631	2.00	1.66
Squibb & Sons, E. R.—Sept. 30 quarter	455,279	520,236	.90	.95
United Carbon Co.—Nine months, Sept. 30	1,285,842	1,214,551	3.23	3.05
United Drug, Inc.—Sept. 30 quarter	617,489	775,275	.44	.55
United Drug, Inc.—Nine months, Sept. 30	1,585,628	1,293,912	1.13	.92
Vick Chemical Co.—Sept. 30 quarter	1,335,689	1,082,468	1.96	1.58

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; ‡‡ Indicated earnings as compiled from quarterly reports; † Net loss; * Not available; ¶¶ Before interest on income notes; *x* Paid on or declared in last 12 months plus extra stock; *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Nov. 7	Nov. 14	Nov. 21	Nov. 28	Net gain or loss last mo.	Price on Nov. 29, 1941	1942 High	1942 Low
Air Reduction Co.	37¼	37	36¾	37	— ¼	35	38⅜	29½
Allied Chemical & Dye Corp.	139¼	140	139¾	136¾	— 2½	149	149	118½
Amer. Agric. Chem.	23¾	24	24⅛	23	— ¾	20¾	24	18¾
Amer. Cyanamid "B"	37¾	37⅞	37⅝	37¼	— ½	37¾	41⅞	28⅝
Columbian Carbon	77½	77½	78	75½	— 2	77½	78	51
Commercial Solvents	9¾	9¾	9½	9½	— ¼	8⅞	10¼	7¼
Dow Chemical Co.	125½	124½	124½	124	— 1½	121	126½	95
du Pont	132¾	131½	120	129	— 3¾	144	144	102¾
Hercules Powder	67	69	70¼	70	+ 3	69½	72	51
Mathieson Alkali Works	24½	24½	22¾	22¾	— 1¾	28½	29½	19½
Monsanto	79	82½	81	81	+ 2	86	91	66
Standard Oil of N. J.	44⅛	43½	43¾	43⅝	— ½	44½	45	30½
Texas Gulf Sulphur	37½	36¾	36⅜	34½	— 3	34	37½	28
Union Carbide & Carbon	75⅞	75¼	74½	74¾	— 1⅛	71½	76⅝	58
United Carbon Co.	54⅞	54	54¾	55½	+ ⅝	43⅞	55¼	37
U. S. Industrial Alcohol	31	30½	30½	30⅛	— ⅞	29¾	34¼	24½

Dividends and Dates

Name	Per Share	Stock Record	Payable
Abbott Lab., com.	.40	12-4	12-24
Extra	.10	12-4	12-24
4% pfd. (quar.)	1.00	1-2	1-15
Allied Chem. & Dye Corp. (quar.)	1.50	12-4	12-19
Alum. Co. of Amer. com. (year-end)	3.00	11-27	12-12
6% pfd. (quar.)	1.50	12-15	1-2
Amer. Agric. Chem.	.30	12-17	12-28
Amer. Cyanamid Co. Class A com. (quar.)	.15	12-12	1-2
Class B com. (quar.)	.15	12-12	1-2
5% pref. (quar.)	.125	12-12	1-2
Special dividend of .75/ share on the class A & B com., payable in the ratio of one share of 5% pref. stock for ea. 13 1/3 share of A or B common held.			
Armour & Co. (Del.) 7% pfd. (quar.	1.75	12-10	1-2
Basic Refractories, Inc. (year-end)	.20	12-5	12-15
Climax Molybdenum Co. (quar.)	.30	12-11	12-22
Year-end	1.00	12-11	12-22
Clorox Chem. Co. (quar.)	.75	12-10	12-21
Colgate-Palmolive-Peet $4.25 pfd. (quar.)	1.06¼	12-8	12-31
Columbian Carbon Co. (year-end)	1.25	11-20	12-10
Com. Solvents Corp.	.30	12-4	12-21
Diamond Alkali Co. (quar.)	.50	11-30	12-12
Du Pont (E. I.) de Nemours, com. (year end)	1.00	11-23	12-14
$4.50 pfd. (quar.)	1.125	1-8	1-25
Durez Plastic & Chem. com. (quar.)	.50	11-24	12-15
6% pref. (quar.)	.375	11-24	12-15
Eastman Kodak Co., com. (quar.)	1.25	12-5	1-2
6% pfd. (quar.)	1.50	12-5	1-2
Fansteel Metallurgical Corp. (year-end)	.25	12-5	12-15
General Refractories (year-end)	.35	12-8	12-22
Harshaw Chem Co.	.25	12-11	12-23
Hercules Powder (year-end)	.90	12-10	12-21
Hooker Electrochem. 6% pfd. (quar.)	1.50	12-11	12-31
Johns-Manville Corp. com.	.50	12-10	12-24
7% pfd. (quar.)	1.75	12-17	1-1
Mathieson Alkali Works, com.	.25	12-7	12-24
7% pfd. (quar.)	1.75	12-7	12-24
McKesson & Robbins, 5¼% pfd. (quar.)	1.31¼	12-4	12-15
Merck & Co., com.	.25	12-17	12-24
4¼% pfd. (quar.)	1.125	12-17	1-2
5¼% pfd. (quar.)	1.31¼	12-17	1-2
Molybdenum Corp. of America	.125	12-5	12-23
Monroe Chem., $3.50 pfd. (quar.)	.875	12-12	1-1
Mutual Chem. Co. of Amer. 6% pfd. (quar.)	1.50	12-17	12-28
Nat. Gypsum Co. (year-end)	.25	12-23	12-30
Nat. Lead Co., com. (quar.)	.125	12-11	12-24
6% pfd. B (quar.)	1.50	1-15	2-1
7% pfd. A (quar.)	1.75	11-27	12-15
Nat. Oil Products	.25	12-10	12-16
Penn. Salt Mfg. Co.	1.75	11-30	12-15
Pfizer (Chas.) & Co.	.35	12-2	12-11
Year-end	.15	12-2	12-11
Procter & Gamble, 5% pfd. (quar.)	1.25	11-25	12-15
S. Phosphate Corp.	.10	12-4	12-15
Squibb (E. R.) & Sons com.	.50	12-4	12-15
$5 pfd. series A (quar.)	1.25	1-15	2-1
Union Carbide & Carbon	.75	12-4	1-1
United Carbon Co.	.75	12-1	12-18
U. S. Potash, com. (irreg.)	.50	12-5	12-24
6% pfd. (quar.)	1.50	12-1	12-15
Victor Chem. Works (year-end)	.30	12-16	12-26
W. Virginia Pulp & Paper	.15	12-15	1-2

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Chemical Stocks and Bonds

1942 November Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
46¼	49⅞	37	55⅝	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
37½	38⅜	29½	45	34⅝	55⅝	36½	Air Reduction	No	2,736,855	2.00	2.62	2.38	1.98
136	149	118½	167½	135	189	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
22½	24	18¾	22⅞	14⅝	21	12⅞	Amer. Agric. Chem.	No	627,981	1.45	1.79	1.45	1.22
32	35	27⅜	35	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	5.60	5.42	3.02
54⅝	70	43	73¾	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
114½	116	111	121	111	124⅝	113½	5% conv. cum. pfd.	100	68,597	5.00	27.77	26.01	18.94
26	26½	15	29⅝	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
118½	120⅜	110	122½	110⅝	121	105½	prior pfd.	100	164,818	7.00	35.08	38.60	38.67
17½	17½	11½	16¼	10⅞	20	10½	Colgate-Palm.-Peet	No	1,962,087	0.50	3.09	1.62	2.74
75	78	51	83	64	98⅝	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
9⅜	10¼	7¼	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
55	55¾	42¼	55⅝	42¾	65½	40¼	Corn Products	25	2,530,000	3.00	3.27	3.10	3.32
174½	179	159	182½	164	184	165	7% cum. pfd.	100	245,738	7.00	41.78	7.23	7.70
17	21	14	21	12¼	23¼	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
125	126	95	141⅝	111½	171	127¼	Dow Chemical	No	1,135,187	3.00	6.58	6.65	3.76
130	144	102¾	164⅝	125½	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
126½	127	120	127	120⅞	129⅝	114	4½% pfd.	No	1,688,850	4.50	53.53	51.48	52.25
144	143	108	145½	120¼	166⅝	117	Eastman Kodak	No	2,488,242	6.00	8.57	7.96	8.55
179½	180	170	182½	160	180	155	6% cum.	100	61,657	6.00	850.14	325.62	337.65
35¼	38¾	27	41	32½	39¼	24⅝	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
4¼	5¾	3⅝	7½	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	1.00	.86	.94
14½	16	12⅛	17⅞	11	19⅝	11	Glidden Co.	No	829,989	1.50	3.08	1.56	1.70
39⅞	44	37¾	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	15.08	8.64	9.27
90¾	93½	79¼	96	76	113¾	80⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
70	72	51	80¼	65¼	100½	60	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
132½	134	125	132½	123½	133½	126¼	6% cum. pfd.	100	96,194	6.00	69.71	66.38	60.87
28¾	29	21	30⅞	20⅝	29	16⅝	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
23	23½	18½	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
107	111½	100¾	113¾	107	113	91	6% pfd.	100	65,661	6.00	32.79	16.99	24.27
8¼	9¼	3½	..	..	..	..	Intern. Min. & Ch.	5	473,981	...	...	...	...
53	55¼	38	..	..	..	..	4% cum. pfd.	100	100,000	...	...	...	...
28¼	30⅞	24⅛	31⅝	23	38⅞	19⅝	Intern. Nickel	No	14,584,025	2.00	2.22	2.30	2.39
41	48¼	39	49	38¼	30⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
21⅜	24	17½	22	17¼	23⅝	14⅝	Kellogg (Spencer)	No	509,213	1.70	3.66	2.74	1.30
30	31¼	20½	45⅝	19⅝	53⅝	30	Libbey Owens Ford	No	2,513,258	3.50	3.52	3.97	3.21
15⅜	16	11⅜	16⅝	13	18⅝	10½	Liquid Carbonic	No	728,100	1.00	2.92	2.21	1.62
22¾	29½	19½	31¼	24½	32⅝	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
79½	91	66	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.32	4.01
114	117½	110	118½	112	119	110	4½% pfd. A.	No	50,000	4.50	38.43	57.38	54.29
118	120	112	123	115	122	113½	4½% pfd. B.	No	50,000	4.50	38.43	57.38	54.29
108	110¾	102½	113½	108⅞	...	...	4 % pfd. C.	No	50,000	4.50	38.43	...	...
12¾	16¼	11⅞	19¼	12¾	23½	14½	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
157	168	145	176	100½	176	160	7% cum. "A" pfd.	100	213,793	7.00	24.68	28.54	27.04
136½	146	129	154	138	153⅝	132	6% cum. "B" pfd.	100	103,277	6.00	49.99	59.46	55.30
35¼	36	29½	30	26	44	28⅝	National Oil Products	4	179,829	1.95	4.11	3.92	3.89
9⅛	11⅜	7¼	11⅞	[illegible]	14¼	6½	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
50¼	54	43¼	54	38¾	64⅝	42	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
49¾	52¾	42	61½	47½	71⅝	53	Procter & Gamble	No	6,409,418	2.00	4.20	4.37	3.80
118⅞	121½	115	120	115	118½	112¼	5% pfd.	100	169,517	5.00	324.38	336.78	298.55
16⅜	16½	10⅛	16⅝	10½	13½	7⅝	Shell Union Oil	No	13,070,625	1.00	1.33	1.05	0.77
28	30¼	19⅜	35¼	18⅞	23¼	12¾	Skelly Oil	No	981,349	1.50	6.03	3.28	1.99
26	27½	20	34½	24⅞	30	20⅝	S. O. Indiana	25	15,272,020	1.00	3.17	2.20	2.24
43¼	45	30½	46⅞	33	46½	29⅞	S. O. New Jersey	25	27,278,666	1.00	5.15	4.54	3.27
8⅝	9⅜	7½	9⅝	6	9½	4¼	Tenn. Corp.	5	853,696	1.00	1.60	1.36	0.41
39¾	40	30	46⅝	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
34½	37½	28	38⅞	30¼	37½	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	2.35	2.38	2.04
74¾	76⅛	58	79⅞	60	89⅝	59⅞	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.88
55¼	55¼	37	52	35	66⅝	42½	United Carbon	No	397,885	3.00	4.30	3.36	3.81
29½	34¼	24½	34¼	20	29	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
15½	20⅞	14¼	34½	15¾	43⅝	25	Vanadium Corp. Amer.	No	405,706	1.50	3.03	2.85	3.25
22⅛	25½	18¾	27¼	19	31½	14	Victor Chem.	5	750,000	1.40	1.59	1.57	1.59
2¼	2⅞	1	2½	⅝	4½	1⅝	Virginia-Caro. Chem.	No	486,122	...	—1.89	—1.36	—1.57
35	40¼	27½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	1.69	2.89	2.41
26⅞	31½	22	36½	27¼	38½	27⅝	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
108½	108¾	100½	112	105	109⅞	106	cum. pfd.	No	58,415	4.50	22.19	21.98	...
NEW YORK STOCK EXCHANGE													
35½	41⅞	28⅝	42⅝	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7⅛	8	6½	7⅝	6⅝	8½	5	Duval Texas Sulphur	No	500,000	1.25	1.42	1.16	1.25
71	88½	65	99	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9.04	7.86	5.96
79¼	85	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	6.82	6.30	4.94
75	78¼	59¾	84	61	100	62½	Sherwin Williams	25	638,927	3.00	7.83	6.57	5.96
112¼	115	110	115½	108½	114⅝	106	5% cum. pfd.	50	122,289	5.00	47.83	39.49	35.05
PHILADELPHIA STOCK EXCHANGE													
156	175½	125	185	162	192	158⅝	Pennsylvania Salt	50	150,000	8.00	10.99	11.51	8.63

1942 November Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
102½	104¼	101¾	104½	100⅝	105¼	100½	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
54½	54½	34	42¼	26¼	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
54½	54½	35	40	25⅝	39⅝	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
100	100	97⅜	99⅞	94⅝	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
105¼	105½	103	106¾	102½	107	101½	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104	105⅝	103⅜	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
104⅝	106¼	104½	107¾	102⅞	106¼	102	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

MAG Whitens Wash
447,983

AEROSIZE
448,748

WAXINE
448,749

SPOSS
448,768

CONJULIN
452,155

CONJUSOY
452,156

Once Over
452,417

Autochemic
452,469

BENZO-TAN
453,049

"BROMO QUIDINE"
453,736

"Z" crete
453,800

PLASTIPITCH
453,824

GOLDGLO
453,858

"VISIBOL"
453,859

RUBY BRITE
453,861

JOHNSON'S Waxed floor CLEANER
454,012

SOLE PROOF
454,097

Velon
454,189

Vita Pine
454,335

PROTELA
454,568

454,775

KINOSAN
455,106

SYPRO BOMB-OUT
455,109

conDocaps
455,239

HAND-SAVER
455,286

SPRAYOLOY
455,310

CENTRAZ
455,326

TRIAD E
455,327

STANDAPOL
455,486

abc OIL RESISTANT PROTECTONE
455,495

ViViBx Vitamins
455,563

MERFENEL A
455,654

NyRub
455,662

Trade Mark Descriptions†

447,983. Lavo Company of America; Milwaukee, Wis.; Oct. 21, '41; for cleaning preparation used for general cleaning purposes which incidentally bleaches, deodorizes, and removes stains; since June 15, '35.

448,748. American Cyanamid & Chemical Corp.; New York, N. Y.; Nov. 19, '41; for sizing preparation for use in the treatment of paper pulp; since '40.

448,749. American Cyanamid & Chemical Corp.; New York, N. Y.; Nov. 19, '41; for sizing preparation for use in the treatment of paper and paper pulp; since '30.

448,768. Simmonds Products, Ltd.; Brentford, England; Nov. 19, '41. For polishing and cleaning preparations—namely, floor cleaners, window cleaners, and terrazo finish, the latter being primarily a cleaner for cleaning floors and walls of terrazzo, marble, and the like; since Aug. 1, '41.

452,155. Woburn Degreasing Company of New Jersey; Harrison, N. J.; Apr. 4, '42; for drying oils—namely, drying oils for paints and varnishes; since Oct. 14, '40.

452,156. Woburn Degreasing Company of New Jersey; Harrison, N. J.; Apr. 4, '42; for drying oils—namely, drying oils for paints and varnishes; since Oct. 14, '40.

452,417. Anthony Di Frances; Milwaukee, Wisc.; Apr. 18, '42; for semi-liquid cleaner for floors, walls, and the like; since Mar. 29, '42.

452,469. Eutectic Welding Alloys, Inc.; New York, N. Y.; April 21, '42; for metallic welding, brazing, and soldering alloys in the form of electrodes and rods coated with or having incorporated therein flux substance; non-tacky cementing material in the nature of a solder spelter for welding, brazing, and soldering purposes; since October, '40.

453,049. Branowner Chemical Company; New York, N. Y.; May 16, '42; for antiseptic, astringent, and deodorant preparations for use on the gums; since Mar. 16, '42.

453,736. The Grove Laboratories, Inc.; Wilmington, Del., and St. Louis, Mo.; June 18, '42; for tablets for the relief of colds, headache, and neuralgia; since May 29, '42.

453,800. Hawkins & Hawkins; Omaha, Nebr.; June 22, '42; for admixture of vermiculate, portland cement and a water proofing compound, said admixture being contained in bags and other suitable containers and used for insulating underground pipes against loss of heat conducted through said pipes; since Dec. 1, '41.

453,824. Coated Products Corp.; Verona, Pa.; June 23, '42; for bituminized sheet steel roofing, roof valleys and gutters and siding; since May 29, '42.

453,858. Special Chemicals Corporation; New York, N. Y.; June 24, '42; for metal plating preparation designed to impart a simulated or imitation gold plate finish; since October, '36.

453,859. Special Chemicals Corporation; New York, N. Y.; June 24, '42; for mixture of chemicals for cleaning operations containing an indicator that changes color when the cleaning potency is impaired; since May, '35

453,861. Special Chemicals Corporation; New York, N. Y.; June 24, '42; for mixture of chemicals and abrasives used in cleaning and polishing of precious and other metals; since February, '37.

454,012. S. C. Johnson & Son, Inc.; Racine, Wis.; July 2, '42; for cleaner for removing old wax and wax emulsions from floors and other surfaces; since Mar. 11, '40.

454,097. The Barbour Company; St. Louis, Mo.; July 8, '42; for liquid leather dressing; since July, '39.

454,189. The Firestone Tire & Rubber Co.; Akron, Ohio; July 13, '42; for synthetic organic resins and plastics; since April 8, '42.

454,335. Standard Wood Preserver Co.; New Orleans, La.; July 20, '42; for wood and fabric preservative termite oil; Dec. '40.

454,568. Albi Chemical Corp.; New York, N. Y.; July 29, '42; for chemical preparations; since July 15, '42.

454,775. American Colloid Co.; Chicago, Ill.; Aug. 7, '42; for clays—namely, bentonite; since July 13, '42.

455,106. Emilio Michelotti, M.D.; Brooklyn, N. Y.; Aug. 25, '42; for bitter stomachic appetizer; since July 7, '41.

455,109. Scientific Products Corporation; Los Angeles, Calif.; Aug. 25, '42; for liquid fire extinguishing agent; since May 25, '42.

455,239. Nion Corporation; Los Angeles, Calif.; Sept. 1, '42; for vitamin capsules containing vitamin D (irradiated ergosterol) and yeast concentrate; since Jan. 13, '42.

455,286. Vanguard Saled Corporation; New York, N. Y.; Sept. 2, '42; for cream for application to the hands; since July 10, '42.

455,310. Powder Metals and Alloys, Inc.; New York, N. Y.; Sept. 3, '42; for metal powders for use in spray guns and other equipment to produce metal coatings and metal articles; since Aug. 7, '42.

455,326. Central Terrazzo & Tile Co.; St. Louis, Mo.; Sept. 4, '42; for adhesive cement for bonding tile, wood, glass, metal, wallboard, concrete, cork, leather, linoleum, plastics, etc.; since July 9, '42.

455,327. Detroit Rex Products Co.; Detroit, Mich.; Sept. 4, '42; for solvent material to extract oil from vegetable matter; since Aug. 3, '42.

455,486. Standard Chemical Products, Inc.; Hoboken, N. J.; Sept. 11, '42; for chemical preparation in liquid form used as a water soluble finishing oil by textile finishers wherever water soluble oils are required to produce specific effects; since June, '30.

455,495. American Bandage Corp.; Chicago, Ill.; Sept. 12, '42; for liquid protective coating used to coat the top layers of surgical bandages; since Aug. 15, '38.

455,563. Victory Vitamin Co.; Chicago, Ill.; Sept. 16, '42; for preparation or product in tablet or powdered form for human consumption, for the purpose of making up any vitamin deficiency in the diet; since Aug. 14, '42.

† Trademarks reproduced and described include those appearing in the *Official Gazette of the U.S. Patent Office,* Nov. 17 to Dec. 15, 1942.

New Trade Marks of the Month

New Trade Marks of the Month

16-to-1
455,709

Spa
455,744

VIKING
455,770

ZYGLO
455,801

NO-EXCUSE
455,805

PROTEGOM
455,841

MAG-DE-SIL
455,846

VAROPLEX
455,849

AMBIDEX
455,883

BETOL
455,935

SERTA-PLUS
455,937

VITA-PLUS
455,938

POLLY
455,941

BRAZO
455,998

FOS-REY
456,007

FLEX-A-PRENE
456,017

THIOFIDE
456,023

Nialk
456,028

VITADAY
456,082

ALGODIN
456,112

TISULIN
456,113

ULTAMIN
456,114

EXAR
456,128

SPIRACORDS
456,137

Koragan
456,216

FIRE SEAL
456,226

PROX
456,249

FABRISEC
456,251

VANTROL
456,348

ARAMIX
456,443

Turbanway's MIRACURL
456,478

TARBONIS
456,537

Trade Mark Descriptions (*Cont'd.*)

455,654. The Hamilton Laboratories, Inc.; Hamilton, Ohio; Sept. 21, '42; for germicide for control of pulp and paper mill slimes; since July 21, '42.

455,662. Nyal Company; Detroit, Mich.; Sept. 21, '42; for a counterirritant, rubefacient and analgesic ointment; since Apr. 5, '39.

455,709. C. A. Nash & Son, Inc.; Norfolk, Va.; Sept. 23, '42; for liquid and paste cleaner for wood, metal, concrete, masonry, and plaster; since '38.

455,744. Baldwin Laboratories; Saegertown, Pa.; Sept. 25, '42; for insect killer, insecticides, and compositions for exterminating insects; since Jan. 5, '42.

455,770. C. W. Schwank Corporation; Baltimore, Md.; Sept. 25, '42; for pine disinfectants, insecticides, deodorant blocks, and pipe and bowl cleaners; since Jan. 1, '40.

455,801. Magnaflux Corp.; Chicago, Ill.; Sept. 26, '42; for fluorescent oil, oil concentrates and powders for use in testing articles for flaws and defects; since July 25, '42.

455,805. Rexclif Products Co.; Portland, Oregon; Sept. 26, '42; for spray deodorants; since Sept. 7, '42.

455,841. Protegom Laboratories; Beverly Hills, Calif.; Sept. 29, '42; for chemical preparation for preserving rubber; since Aug. 22, '42.

455,846. The Permutit Co.; New York, N. Y.; Sept. 29, '42; for absorption materials used in the purification and treatment of water and other liquids; since July 25, '42.

455,849. Premo Pharmaceutical Laboratories, Inc.; New York, N. Y.; Sept. 29, '42; for pharmaceutical preparation of vitamin B complex in the form of an elixir, capsules, tablets and syrup; since Oct. '40.

455,883. Binney & Smith Co.; New York, N. Y.; Oct. 1, '42; for plasticizer with activating properties for use in the manufacture of rubber and rubber-like compounds; since Sept. 23, '42.

455,935. Valentine Laboratories, Inc; Chicago, Ill.; Oct. 2, '42; for vitamin B preparation; since Aug. 10, '42.

455,937. Vitamins Plus, Incorporated; New York, N. Y.; Oct. 2, '42; for vitamin tablets; since Sept. 14, '42.

455,938. Vitamins Plus, Incorporated; New York, N. Y.; Oct. 2, '42; for vitamin tablets; since Sept. 14, '42.

455,941. Pollard Oil Products Co.; Milwaukee, Wis.; Oct. 2, '42; for foundry supplies, specifically, core wash; mudding compound; pattern coating material; formula compound as a foundry sand hot strength ingredient; and a filler including plumbago and a synthetic binder; Apr. 19, '40.

455,998. Corn Products Refining Co.; New York, N. Y.; Oct. '42; for tapioca starch for manufacturing purposes; since Sept. 18, '42.

456,007. Sunset Laboratories; Glendale, Calif.; Oct. 6, '42; for liquid chemical product having food value and prepared by the aqueous extraction of the embryo of wheat, oats, barley, and rye; since Dec. 15, '34.

456,017. Heil Engineering Co.; Cleveland, Ohio; Oct. 7, '42; for chemical resistant lining or coating for tanks or similar articles; since June 6, '35.

456,023. Monsanto Chemical Company; St. Louis, Mo.; Oct. 7, '42; for di benzothiazyl disulfide used as a vulcanization accelerator in the curing of rubber articles; since June 6, '35.

456,028. Niagara Alkali Co.; Niagara Falls, N. Y.; Oct. 7, '42; for caustic soda, caustic potash, carbonate of potash, bleaching powder, orthodichloro-benzene, paradichlorobenzene and chlorine products used for bleaching, sanitary purposes, disinfecting, sterilizing and as insecticides and deodorants; since Sept. 11, '42.

456,082. Purepac Corporation; New York, N. Y.; Oct. 8, '42; for vitamin preparation; since Sept. 29, '42.

456,112. Alba Pharmaceutical Co., Inc.; New York, N. Y.; Oct. 10, '42; for inorganic preparation for use in the treatment of various respiratory diseases—namely, coryza, subacute rhinitides, rhinitis vasomotoria, hydrorrhoea nasalis, asthma bronchiale, and hay fever; since Sept. 15, '42.

456,113. Alba Pharmaceutical Co., Inc.; New York, N. Y.; Oct. 10, '42; for anesthetic for the mouth and throat; since Sept. 15, '42.

456,114. Alba Pharmaceutical Co., Inc.; New York, N. Y.; Oct. 10, '42; for medicinal preparation for treating inflammation of the under bronchial ways and lungs; since Sept. 15, '42.

456,128. McKesson & Robbins, Inc.; New York, N. Y.; Oct. 10, '42; for analgesic tablets; since Oct. 7, '42.

456,137. Behr-Manning Corp.; Troy, N. Y.; Oct. 12, '42; for coated abrasives; since Sept. 18, '42.

456,216. The Knox Company; Los Angeles, Calif.; Oct. 15, '42; for medicinal preparations to stimulate the circulatory system of the human body; since May 1, '42.

456,226. United Laboratories, Inc.; Cleveland, Ohio; Oct. 15, '42; for fire extinguishing powder; since Sept. 8, '42.

456,249. Proxite Products Company, Inc.; Brooklyn, N. Y.; Oct. 16, '42; for solution for use as a cleanser, disinfectant, bleach, and deodorant; since March, '37.

456,251. Socony-Vacuum Oil Company, Inc.; New York, N. Y.; Oct. 16, '42; for waterproofing composition for textile fabrics; since Sept. 19, '41.

456,348. Van Straaten Chemical Co.; Chicago, Ill.; Oct. 22, '42; for metal degreasing and metal washing compounds; since Jan. 9, '41.

456,443. The Arabol Mfg. Co.; New York, N. Y.; Oct. 27, '42; for adhesive dextrine; since Oct. 1, '42.

456,478. Turbanway, Inc.; New York, N. Y.; Oct. 27, '42; for hair waving solutions; since Oct. 1, '42.

456,537. Donald Merbell & Company; Wyoming, Ohio; Oct. 30, '42; for pharmaceutical preparations useful in the treatment of itching and irritation in certain types of skin sensitivity including the more common types of industrial dermatoses; since May 5, '42.

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to October 31, 1942. This month new regulations are brought up to November 30, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Acetic Acid

Nov. 27, 1942. Adjustable pricing for sales of acetic acid established by Office of Price Administration to aid sellers and buyers preferring to make long-term contracts.

Alcohol

Nov. 11, 1942. Amendment No. 2 to General Preference Order M-30 forbids unrestricted sale of rubbing alcohol and rubbing alcohol compounds. The amendment forbids delivery of any ethyl alcohol or any compound containing it for use as a rubbing alcohol, except to licensed physicians, dentists and veterinarians.

Butyl Alcohol

Nov. 21, 1942. The War Production Board has amended General Preference Order M-159. Under the amended order, butyl alcohol, which is defined as "normal, secondary and tertiary butyl alcohol and includes isobutyl alcohol," is under complete allocation. Persons who require more than 54 gallons of butyl alcohol in any calendar month and who seek authorization to accept deliveries during any calendar month must file applications on or before the tenth day of the preceding month using form PD-600. Producers or distributors seeking authorization to make delivery must use form PD-601. Where the material is purchased from a distributor and not a producer, these forms must be filed not later than the seventh day of the preceding month.

Castor Oil, Glycerin, and Metallic Mineral Substances

Nov. 20, 1942. Castor oil, glycerin, and metallic mineral substances in crude form and not otherwise classified were moved from list I to list II of Imports Order M-63 by WPB, making possible the processing or movement of these commodities without special authorization.

Chrome Ores

Nov. 4, 1942. Maximum prices for chrome ores, designed to stabilize ore costs for producers of ferrochromium, chromium chemicals, and chrome refractory products were announced by Office of Price Administration.

Fats and Oils

Nov. 13, 1942. OPA ruling permits sellers of refined soybean oil peanut oil and cottonseed oil, for non-edible industrial purposes, to advance their present ceiling prices under the fats and oils regulation by ½ cent per lb.

Nov. 18, 1942. Control over fats and oils was clarified by the issuance of Official Interpretation No. 1 to General Preference Order M-71 by the Director General for Operations. The effect of the order is to exempt from the quota restrictions the use of fats and oils in any edible product of which fat or oil is not the principal ingredient.

Nov. 24, 1942. The War Production Board amended General Preference Order M-71. The amendment restricts deliveries of linseed oil to 70% of the average quarterly amount of linseed oil delivered during 1940 and 1941. The order also has been amended as to manufacture restrictions and contains a list of the permitted percentages for manufacturing.

Fertilizers

Nov. 6, 1942. The present price ceilings on fertilizer which have been frozen at February 16-20, 1942, levels may shortly be raised by approximately 8 per cent to cover increased costs of nitrogen and transportation since that base period, according to an announcement by the Office of Price Administration. A new price regulation, effecting this adjustment by fertilizer production areas according to increased costs in each area, probably will be issued within the next four to five weeks.

Formaldehyde

Nov. 27, 1942. Adjustable pricing for sales of formaldehyde established by Office of Price Administration to aid sellers and buyers preferring to make long-term contracts.

Fluorspar

Nov. 23, 1942. An increase in maximum prices for metallurgical fluorspar, designed to stimulate production, expand facilities and encourage new producers to enter the fluorspar field was announced by OPA.

Glycerin

Dec., 1942. Directives have been sent to producers and distributors of glycerin informing them of the quantity percentages that may be delivered during December. The allocation schedule applies to deliveries of from 50 to 10,000 pounds during the month. Deliveries are to be withheld from all customers who have not filed a statement of December requirements before November 15 as provided for in M-58.

Lead

Nov. 11, 1942. Restrictions on lead use by amendment to Order M-38-C lifted to permit a number of essential uses formerly in force on the use of lead in certain building supplies, in foil for industrial babbit, in certain food packaging, in lead sheathed cable, in caskets and in nameplates for machinery.

Lithopone

Nov. 27, 1942. Adjustable pricing for sales of lithopone, established by Office of Price Administration to aid sellers and buyers preferring to make long-term contracts.

Methylethyl Ketone

Nov. 21, 1942. The War Production Board has amended General Preference Order M-169. The amended order places this product under direction allocation.

Nitrogen Fertilizers

Nov. 21, 1942. Prohibitions on delivery of chemical nitrogen fertilizers for use in 1943 has been extended to December 1, 1942, by amendment No. 2 to Conservation Order M-231, issued by the Director General for Operations.

Phenolic Resins

Nov. 4, 1942. General Preference Order M-246 issued by the Director General for Operations puts phenolic resins and phenolic resin moulding compounds under complete allocation and use control, effective December 1, 1942. Orders under 55 gallons per month are exempted.

War Regulations

Priorities, Allocations, Important Price Controls—p. 40

Phosphate Plasticizers

Nov. 6, 1942. Allocation of phosphate plasticizers was included with other current chemical allocations by requiring the use of the standard chemicals allocation forms, PD-600 and PD-601, under an amended form of the order issued by the Director General for Operations.

Platinum

Nov. 7, 1942. Use of platinum in all jewelry manufacture has been stopped by an amendment to Conservation Order M-162 issued by the Director General for Operations. The order does not affect sale of platinum jewelry now manufactured and in the hands of dealers and retailers.

Research Chemicals

Nov. 14, 1942. Revision of Preference Rating Order P-43 and the issuance of a new preference rating order P-135 issued by Director General for Operations to expand supplies for research and control laboratories.

Rotenone

Nov. 5, 1942. A government program for the purchase and importation of rotenone from Brazil and Peru to be carried out by Commodity Credit Corporation was announced jointly by the United States Dept. of Agriculture and the Board of Economic Warfare.

Purchases will be made through existing commercial companies acting as agents for the CCC, so as not to disturb normal business channels. Sales of stock acquired under the program will be made upon approval of the WPB at prices that are not in excess of prices established by OPA.

Saltcake

Nov. 12, 1942. Amendment to general inventory order M-161 removes inventory restrictions on saltcake (sodium sulfate).

Substituted Phenols

Nov. 3, 1942. Allocation of phenol has been extended to include certain substituted phenols and phenol-bearing materials by General Preference Order M-27, as amended on the above date.

The amended order provides that after December 1, 1942, no person may sell, deliver, accept delivery of, or use any of the materials covered by the order unless he has specific authorization by WPB to do so.

Tin Oxide

Nov. 24, 1942. Manufacture and use of tin oxide were forbidden by an amended version of M-43-a issued by the Director General for Operations. The order formerly permitted its use on orders bearing a rating of A-1-k or higher. The amended order also limits the amount of tin which may be used in coating for foundry chaplets to 5% or less.

Titanium Pigments

Nov. 27, 1942. Adjustable pricing for sales of titanium pigments established by Office of Price Administration to aid sellers and buyers preferring to make long-term contracts.

Tungsten

Nov. 27, 1942. All supplies of tungsten wire, rod, sheet, and powder were placed under complete allocation control today by an amended version of Order M-29, it was announced by the Director General for Operations.

Vanilla Beans

Nov. 27, 1942. Because present ceiling prices for vanilla beans do not make adequate provision for additional costs of small-lot transactions, the Office of Price Administration today authorized primary dealers and wholesalers to charge premiums on sales of 50 pounds or less.

Wax

Nov. 13, 1942. OPA has reduced prices of imported waxes produced mainly in Brazil and Mexico in selling specific dollar and cents prices.

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A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Fertilizer blood as a glue base. No. 2,292,624. William Dawes Fawthrop to Adhesive Products Co.
Ammoniated agricultural material as livestock feed and process of producing same. No. 2,293,845. Harvey Millar to The Quaker Oats Co.

Cellulose

Process treating lignocellulose material for producing product capable of being molded under heat and pressure in presence of plasticizer form a product having high wet and dry strength and low water absorption. No. 2,292,389. John Meiler to Marathon Paper Mills Co.
Process of treating lignocellulose material to make product capable of being molded under heat and pressure in presence of plasticizer to form product having high wet and dry strength and low water absorption. No. 2,292,390. John Meiler to Marathon Paper Mills Co.
Moistureproofed sheet wrapping material comprising water sensitive cellulosic film and moistureproofing coating. No. 2,292,393. James Mitchell to E. I. du Pont de Nemours & Co.
Cellulose product. No. 2,292,513. Charles Fourness and Edward Voigtman to Paper Patents Co.
Method of making greaseproof cellulosic sheet material. No. 2,293,466. James Juhasz to Maurice Wright.
Method for dissolving cellulose. No. 2,293,503. Kurt Hess and Max Ulmann.
Process for dehydrating cellulose products, foods, and the like. No. 2,293,728. Berthold Freund.
Process for imparting soft feel to regenerated cellulose. No. 2,293,826. Martin Iselin and Jakob Bindler to J. R. Geigy A.G.
Method of bonding sheet cellulosic, plastic materials to porous, fibrous materials. No. 2,294,159. Ernest Calabro to Polaroid Corp.
Method of removing gaseous constituents from fouled cellulose regenerating baths from the regeneration of cellulose xanthate viscose. No. 2,294,827. Robert B. Booth to Manville Jenckes.
Treatment of cellulose with alkali metal amides in anhydrous aliquid ammonia. No. 2,294,924. Clemmy O. Miller and Arthur E. Siehrs to North American Rayon Corp.
Alpha cellulose pulp. No. 2,295,215. Herman L. Joachim to Maul Agricultural Co., Ltd.

Ceramics, Refractories

Method producing non-slip vitreous enamel surface having unglazed areas elevated relative to the remaining glazed area. No. 2,292,369. Charles Gordon to Porcelain Metals Corp.
Method obtaining glass mold charges. No. 2,292,370. Enoch Ferngren.
Siliceous magnesia refractory manufacture. No. 2,292,644. Harley Lee to Basic Refractories, Inc.
Method of differentially opacifying glass. No. 2,292,684. Henry Blau to Corning Glass Works.
Mix for a vitrified abrasive form comprising grain, felspar and Portland cement. No. 2,292,758. Charles Hite.
Refractory material comprising chromite, stabilized calcium orthosilicate and periclase. No. 2,292,903. Gilbert Seil to E. J. Lavino and Co.
Method of making abrasive article which comprises mixing fused alumina grain with a ceramic bond. No. 2,293,099. John Barnes, Wilber Parsons and Garret Van Nimwegen to The Carborundum Co.
Process of metallizing glass. No. 2,293,822. Charles Haven to Libbey-Owens-Ford Glass Co.
Manufacture of optical glass. No. 2,294,077. Frank Dobrovolny to E. I. du Pont de Nemours & Co.
Abrasive composition comprising abrasive grains, a potentially reactive phenolic resin and a reactive magnesium oxide in finely comminuted form. No. 2,294,239. Emil Novotny and Joseph Kuzmich to Durite Plastics, Inc., and to Raybestos-Manhattan, Inc.
Process of preparing self-bonding glass or enamel composition for use in enamel-coating. No. 2,294,761. William C. Morris to Poor & Co.
Method of producing enamel chips directly from molten enamel. No. 2,294,828. Robert C. Boyd, Harry C. Roach and Charles E. McNeal to American Radiator & Standard Sanitary Corp.
Phosphate glass batch. No. 2,294,844. Frederick Gelstharp to Pittsburgh Plate Glass Co.
Process of making enamel having a zirconium-containing opacifying constituent, particularly adapted for application to ceramicware. No. 2,294,931. Maxime Paquet.

Chemical Specialty

Shaving preparation comprised of mixture of base or primary shaving material selected from beeswax, paraffin wax, carnauba wax, Chinese insect wax, stearic acid, and palmitic acid, and of surface-active material. No. 2,292,419. Herbert Wetherbee to Richard F. Grant and Benton H. Grant.
Process of preparing organic beverage. No. 2,292,460. Ronald McKinnis to Sunshine Foods, Inc.
Acetone-resin printing ink. No. 2,292,748. Carleton Ellis, Carleton Ellis, Jr., Bertram Ellis and Bank of Montclair to Ellis Laboratories, Inc.
Insecticide. No. 2,292,756. Herbert Haller to Henry A. Wallace.
Pest control composition. No. 2,293,034. William Moore to American Cyanamid Co.
Coating composition comprising solution of cellulose derivative lacquer base chosen from cellulose esters and ethers in an organic solvent, and also comprising a fatty oil having dispersed therein at 100° C. to 300° C. not more than 10 percent of a polar compound. No. 2,293,038. Laszio Auer.
Lubricating composition, comprising a mineral oil, a lithium soap and a calcium soap. No. 2,293,052. Clarence Earle.
Insect repellent. No. 2,293,255. Philip Granett to National Carbon Company, Inc.
Insect repellent. No. 2,293,256. Philip Granett to National Carbon Company, Inc.
Concrete curing composition. No. 2,293,410. Stanley Sorem to Shell Development Co.
Leak-sealing composition. No. 2,293,546. Reynold Holmen to E. I. du Pont de Nemours & Co.
Cork composition and method of manufacture. No. 2,293,805. Giles Cooke and Michael Ebert to Crown Cork & Seal Co.
Coconut product which maintains pasty or plastic homogeneous condition at temperatures substantially above as well as below the melting point of coconut oil. No. 2,293,848. Thomas Rector to General Foods Corp.
Detergent composition which dissolves in hard water without substantial formation of curds. No. 2,294,075. Robert Colgate and Emil Dreger to Colgate-Palmolive-Peet Co.
Deodorant Cream. No. 2,294,140. Walter Taylor to Atlas Powder Co.
Cosmetic preparation, containing as base hydrogenated castor oil. No. 2,294,229. George Fiero.
Cosmetic preparation adapted for application to face, devoid of tendency to lather. No. 2,294,233. Benjamin Harris.
Insecticidal composition. No. 2,294,238. Donald Murphy to Rohm & Haas Co.
Printing paste for textile printing. No. 2,294,246. Lester Schniepp and Wilber Teeters to E. I. du Pont de Nemours & Co.
Insecticidal composition. No. 2,294,299. William Hester and W. E. Craig to Rohm & Haas Co.
Poultry anticoccidiotic essentially comprising colloidal sulfur and urea. No. 2,294,401. Leslie R. Harrison.
Process for desalting fish. No. 2,294,428. Paul Stockhamer.
Wire drawing lubricant. No. 2,294,535. Arthur W. Burwell to Alox Corp.
Rust preventing composition. No. 2,294,571. Theron P. Remy.
Water soluble adhesives obtained by etherifying wood. No. 2,294,-666. Michael Jahrstorfer and Julius Beck to General Aniline & Film Corp.
Method of making nut butters. No. 2,294,682. Williamson W. Moss, Jr.
Direct process duplicating solvent. No. 2,294,711. Johan Bjorksten to Ditoo, Inc.
In treatment of lithographic printing plates after formation of the printing image, before printing, applying to the non-image areas of the plate an aqueous solution of mesquite gum with smaller amounts of a soluble bichromate and phosphoric acid. No. 2,294,-944. William H. Wood to Harris-Seybold Potter Co.
Free flowing invert emulsion cleansing and polishing composition. No. 2,295,132. Thomas E. Sharp and George W. Fline to Standard Oil Co.
Method of preparing homogeneous honey pectin composition. No. 2,295,274. Joseph Walker.

Coal Tar Chemicals

Process for the introduction of aryl groups into a-b-unsaturated carbonyl compounds and their derivatives. No. 2,292,461. Hans Meerwein to Sherka Chemical Co., Inc.
N. hydroxyalkyl n-aryl sulfonamides and their derivatives composition of matter containing organic film-forming thermoplastic substance, said substance being plasticised with aid of an N-hydroxyalkyl N-aryl aryl sulfonamide. No. 2,292,464. William Moss to Celanese Corp. of America.
Naphthostyril-5-carboxylic acid. No. 2,292,551. Frederic Stilmar to E. I. du Pont de Nemours & Co.
Fluoranthene derivatives and process of preparing same. No. 2,292,-691. Walter Kern and Theodor Holbro, and Richard Tobler to Society of Chemical Industry in Basle.
Capillary-active sulfonic acid imides. No. 2,292,997. Winfrid Hentrich and Eril Schirm to "Unichem" Chemikalien Handels A.-G.
Process for the manufacture of mercaptothiazolines. No. 2,293,465. Jacob Jansen to The B. F. Goodrich Co.
Alpha-beta-dichloro-meta-tolylethane and process for making same. No. 2,293,772. Frank Soday to The United Gas Improvement Co.
Alpha-beta-dichloro-para-tolylethane. No. 2,293,773. Frank Soday to The United Gas Improvement Co.
Preparation of alpha tolylethyl alcohol. No. 2,293,774. Frank Soday to The United Gas Improvement Co.
Para tolylethyl acetate. No. 2,293,775. Frank Soday to United Gas Improvement Co.
Manufacture of dicarboxylic acid anhydride. No. 2,294,130. Frank Porter to The Solvay Process Co.
Hydroxy ketones of the cyclopentanopolyhydrophenanthrene. No. 2,294,433. Ulrich Westphal, Arthur Serini, and Heinrich Koster to Schering Corp.
Degradation products containing carboxyl groups from compounds of the estrane series containing at least one double bond in ring B. No. 2,294,616. Walter Hohiweg, and Hans Herloff Inhoffen to Schering Corp.

Coatings

Process for producing coated fabric sheet material which comprises calendering on flexible fabric sheet a heated plastic mixture. No. 2,292,441. Bernard Habgood, Maldwyn Jones and Walter Fairbairn Smith to Imperial Chemical Industries, Ltd.
Finishing composition comprising 10 to 50% plasticizer, 10 to 75% of the resinous reaction product of urea, formaldehyde and monohydric alcohol, and 10 to 50% of the resinous reaction product of ingredients consisting essentially of a maleic compound. No. 2,292,468. Edmund Oeffinger and Harry Stauffer to E. I. du Pont de Nemours & Co.

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Acceleration of the seasoning speed of surface covering. No. 2,292,541. Donald Patterson to American Cyanamid Co.
Acceleration of the speed of seasoning of surface covering compositions. No. 2,292,542. Donald Patterson to American Cyanamid Co.
Enamel composition. No. 2,293,146. Karl Kautz to Climax Molybdenum Co.
Method of producing prints on gelatin coated print stock. No. 2,293,406. Henrik Sartov and Alfred Lindstedt to Omnicolor Pictures Corp.
Coated metal surface provided with a single baked-on polarity-stratified coating. No. 2,293,413. Frank Stoner, Jr. and Daniel Gray to Stoner-Mudge, Inc.
Coating composition comprising a varnish made from China-wood oil and oil-soluble phenol-formaldehyde resin. No. 2,293,428. Loy Engle to Interchemical Corporation.
Moistureproof sheet wrapping material. No. 2,293,458. Maurice Ernsberger to E. I. du Pont de Nemours & Co.
Heat stable thermoplastic coating materials. No. 2,294,211. David Rothrock to The Resinous Products & Chemical Co.
Surface covering combination base supporting surface, an outer magnesium oxychloride cementitious wearing layer and bonding layer of latex. No. 2,294,247. Walter Smith.
Method of surface-coating aluminum. No. 2,294,334. William Filbert to E. I. du Pont de Nemours & Co.
Process for polishing coatings. No. 2,294,479. Richard C. Peter to E. I. du Pont de Nemours & Co.
Wrinkle finish composition. No. 2,294,703. William A. Waldie to New Wrinkle, Inc.
Method of sealing and waxing anodized aluminum surfaces. No. 2,294,717. Clifford R. Carney.
Process for coating metal surfaces. William C. Morris, to Poor & Company.
Coating composition having infrared reflecting characteristics to nature's deciduous greens. No. 2,294,875. Paul L. Hexter and Russel Shepheard to The Arco Co.
Protective coating for metals. No. 2,295,063. James N. Tuttle to James N. Tuttle (Rustproofing and Metal Finishing Co.)

Dyes, Stains

Method of providing finely divided efficient luminescent material. No. 2,292,555. Ludwig Wesch to Telefunken Gesellschaft fur Drahtlose Telegraphic m.b.H.
Dyestuff intermediate products from bile acid amides. No. 2,292,575. Hans Lolet, and Gustav Wilmanns to General Aniline & Film Corp.
Producing photographic colored pictures by dyestuff forming development, the improvement which comprises developing an exposed photographic silver halide emulsion with aromatic amino developer in presence of color former selected from class consisting of hydroxypyridines and hydroxy-2-pyridones in which ring N-atom is tertiary. No. 2,293,004. Hermann Lohaus to General Aniline & Film Corp.
Dyestuffs of the anthraquinone series. No. 2,293,254. Donald Graham to E. I. du Pont de Nemours & Co.
Dyestuffs of the anthraquinone series. No. 2,293,709. Edwin Buxbaum to E. I. du Pont de Nemours & Co.
Monoazo dyestuffs and their manufacture. No. 2,293,804. Achille Conzetti and Otto Schmid to J. R. Geigy A.G.
Azo compound. No. 2,294,380. William Braker to E. R. Squibb & Sons.
Process of coloring granules. No. 2,294,523. Marion H. Veazey to The Patent and Licensing Corp.
Process for strengthening the hue of dyestuff pictures in a multilayer material. No. 2,294,731. John Eggert and Gerd Heymer to General Aniline & Film Corp.
Dyes for photographic layers. No. 2,294,892. Burt H. Carroll and Honas J. Chechak to Eastman Kodak Co.
Dyes for photographic layers. No. 2,294,893. Burt H. Carroll and Honas J. Chechak to Eastman Kodak Co.
Dyestuffs and process of coloring. No. 2,294,968. George Holland Ellis and Frank Brown to Celanese Corp. of America.
Photographic color forming compound. No. 2,295,008. Henry D. Porter and Arnold Weissberger to Eastman Kodak Co.
Photographic color forming compound. No. 2,295,009. Henry D. Porter and Arnold Weissberger to Eastman Kodak Co.
Process for preparing lubricating oil dyes. No. 2,295,035. George R. Gilbert and Albert A. Peer to Standard Oil Development Co.
Azo dyes. No. 2,295,050. William B. Reynolds, Swanie S. Rossander and Donovan E. Kvalnes to E. I. du Pont de Nemours & Co.

Equipment, Apparatus

Sediment test record card. No. 2,292,450. Milton Kohn
Electric apparatus for separation of suspended solid particles from organic liquids. No. 2,292,608. Stanley Buckman and Victor Hribar to American Cresoting Co.
Element for photocells and rectifiers. No. 2,293,248. Colin Garfield Fink and Edward Adler.
Asphalt drum lining. No. 2,293,249. Herbert Fischer to Standard Oil Development Co.
Method of and apparatus for storing liquefied gas mixtures. No. 2,293,263. Henry Kornemann and Edward Yendall to The Linde Air Products Co.
Apparatus for the production or storage of fluorine having insulating and sealing materials prepared from a substance selected from the group consisting of rubber and artificial rubbers. No. 2,293,266. Joseph Mitchell, to Imperial Chemical Industries, Ltd.
Educational device for teaching the formation of chemical compounds. No. 2,293,405. Elwyn Russell Belmont to Cambosco Scientific Co.
Apparatus for processing synthetic textile fibers. No. 2,293,825. Lee Hosfield to Carbide and Carbon Chemicals Corp.
Apparatus for manufacture of rayon yarn according to centrifugal pot spinning method. No. 2,293,970. Bastiaan de Klerk to American Enka Corp.
Method of making sound absorbing materials. No. 2,295,155. George B. Brown and Osborn Ayers to Johns-Manville Corp.

Explosives

Smokeless powder. No. 2,292,469. Fredrich Olsen to Western Cartridge Co.
Priming mixture for small arms ammunition comprising the double salt of lead styphnate and lead hypophosphite. No. 2,292,956. Joseph McNutt and Samuel Ehrlich to Western Cartridge Co.
Preparation and purification of nitrated pentaerythritols. No. 2,294,592. Joseph A. Wyler to Trojan Powder Co.
Manufacture of normal lead trinitroresorcinate and double salts thereof. No. 2,295,104. Frederick M. Garfield to Western Cartridge Co.

Fine Chemicals

Method of obtaining a therapeutic product for inhibiting gastric motility and secretion. No. 2,292,841. Heinrich Necheles to Michael Reese Research Foundation.
Process for producing methyltrimethylolmethane by reaction of formaldehyde and propionaldehyde. No. 2,292,926. Merlin Brubaker and Ralph Jacobson to E. I. du Pont de Nemours & Co.
Process for hydrogenation of 2-iminonitriles. No. 2,292,949. Wilbur Lazier and Benjamin Howk to E. I. du Pont de Nemours & Co.
Monobutylol cyanamide compound. No. 2,293,027. Walter Ericks to American Cyanamid Co.
a-N-amyl cinnamal ethyl cyanoacetate. No. 2,293,032. Ingenuin Hechenbleikner to American Cyanamid Co.
Light sensitive silver halide emulsion containing a de-sensitising agent. No. 2,293,261. John Kendall to Ilford Limited.
Acetyl salicylic acid preparation having average particle size substantially smaller than 14 microns. No. 2,293,359. Sverre Quisling.
Benzal octyl cyanoacetate. No. 2,293,463. Ingenuin Hechenbleikner to American Cyanamid Co.
Esters of aliphatic acids with isopropyl alcohol. No. 2,293,551. Eric Kunz and Max Luthy.
Thiobarbituric compound. No. 2,293,770. Horace Shonle and Wilbur Doran to Eli Lilly and Co.
Preparation of therapeutically useful heterocyclic compounds. No. 2,293,811. Arthur Ewins and Montague Phillips to May & Baker Limited.
Methol of enlarging the pores of semipermeable cellulose nitrate layer of a photographic element. No. 2,293,816. Pierre Glafkides.
Amino compound having pressor effect. No. 2,293,874. Eugene Woodruff to The Upjohn Company.
Amino compound having brorchodilator effect. No. 2,293,875. Eugene Woodruff to The Upjohn Company.
Amino compound having brorchodilator effect. No. 2,293,876. Eugene Woodruff to The Upjohn Company.
Amino compound having pressor effect. No. 2,293,877. Eugene Woodruff to The Upjohn Company.
Stable colloidal aqueous suspension of phenothiazine. No. 2,294,888. James A. Austin to Jensen-Salsbery Labs., Inc.
Antacid composition for treatment of gastro-intestinal tract containing aluminum phosphate. No. 2,294,889. Alfred Barol to John Wyeth and Bro., Inc.
Photographic silver salt emulsion layer containing a dye component. No. 2,294,909. Andrew B. Hennings, to E. I. du Pont de Nemours & Co.
As a therapeutic agent the product of the reaction of an organic therapeutic compound having a reactive NH group taken from the class consisting of ephedrine, benzedrine, and adrenaline, with an amount of cevitamic acid sufficient to convert substantially all of the said compound into an addition compound with cevitamic acid, said product being soluble in water and non-toxic to human beings. No. 2,294,937. Simon L. Ruskin.
Oxygenated estrogenic hormones and method of preparing same. No. 2,294,938. Erwin Schwenk to Schering Corp.
Vitamin B assimilation by yeast. No. 2,295,036. Henry J. Gorcica and Harold Levine to Pabst Brewing Co.
Method of purifying phenothiazine. No. 2,295,074. Edgar C. Britton and Joseph E. Eisenman to The Dow Chemical Co.
Process of preparing vitamin K concentrates. No. 2,295,129. Byron Reigel and Perrin G. Smith, Carl E. Schweitzer and Vernon C. Free to Abbott Laboratories.
Photographic emulsion. No. 2,295,276. Gustav Wilmanns and Oskar Riester to General Aniline & Film Corp.
Manufacture of trimethyl-para-benzoquinone. No. 2,295,446. Robert Behnisch to Winthrop Chemical Co., Inc.
Micro-organism inhibiting composition which comprises as the essential active ingredient, a soluble cetyl trimethyl ammonium compound. No. 2,295,505. Robert Shelton to Wm. S. Merrell Co.

Industrial Chemicals

Stabilization of tetraethyl lead and a motor fuel containing a stabilized tetraethyl lead. No. 2,292,352. Elmer Cook and William Thomas, Jr. to American Cyanamid Co.
Manufacture of amorphous carbon. No. 2,292,355. Joseph Ayers to C. K. Williams & Co.
Method pumping volatile liquid having boiling point temperature not higher than 233° K. at atmospheric pressure against relatively high head of pressure. No. 2,292,375. Odd Hansen to The Linde Air Products Co.
Process for making polymeric carbamides. No. 2,292,443. William Hanford to E. I. du Pont de Nemours & Co.
Method of drying a food product containing water comprising freezing product subjecting frozen product to vacuum and then raising temperature of frozen product while residual water is being removed. No. 2,292,447. James Irwin, Jr. to United States Cold Storage Corp.
Textile treatment agent. No. 2,292,479. Reginald William Reynolds, John Rose and Eric Everard Walker to Imperial Chemical Industries, Ltd.
Purification of calcium carbonate. No. 2,292,503. Edward Allen to Pittsburgh Plate Glass Co.
Method for reducing acidity of crystalloidal liquid titanium salt solution without disturbing the crystalloidal properties. No. 2,292,506. L'Roche Bousquet and Maxwell Brooks to General Chemical Co.

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Method for hydrolytically precipitating titanium oxygen compounds. No. 2,292,507. Maxwell Brooks to General Chemical Co.
Method of preparing preconditioned cast-forming materials. No. 2,292,531. Stanley Lovell to Castex Laboratories, Inc.
Process for making alcohols which comprises passing at an elevated temperature and under relatively high pressure a gaseous mixture containing as essential ingredients appreciable amounts of water vapor and an olefin over a catalyst. No. 2,292,561. James Eversole and Charles Rehm, and Edward Doughty to Carbide and Carbon Chemicals Corp.
Process for the production of a catalyst comprising as an essential constituent a metal of the iron group. No. 2,292,570. Richard Klemm and Eduard Linckh to Standard Catalytic Co.
Polymerized cashew nut shell liquid residue. No. 2,292,611. Solomon Caplan to The Harvel Corp.
Gypsum composition of matter particularly adapted for sealing earth formations. No. 2,292,616. Manvel Dailey to United States Gypsum Co.
Adsorbent material and process of manufacturing same. No. 2,292,632. Herbert Greger.
Method of regenerating catalysts by removal of carbonaceous deposits. No. 2,292,699. Louis Kassel to Universal Oil Products Co.
Plasticized composition containing a polyvinyl acetal and a plasticizer which is a partially hydrogenated mesityl oxide condensation product. No. 2,292,734. Franklin Bent and Francis Gordon to Shell Development Co.
Recovery of solids from industrial wastes. No. 2,292,769. Ellis Pattee to National Distillers Products Corp.
Manufacture of heterocyclic compounds. No. 2,292,808. Henry Waterman and Donald Vivian.
Process of refining glyceride oils and fats containing gums, color impurities and free fatty acids. No. 2,292,822. Benjamin Clayton to Refining, Inc.
Composition of matter comprising an amino containing hydroxy ethyl radical and blown oil fatty acid radical derived from castor oil. No. 2,292,824. Melvin De Groote, Bernhard Keiser and Charles Blair, Jr. to Petrolite Corp., Ltd.
Production of aromatic amines. No. 2,292,879. Mearl Kise to The Solvay Process Co.
Modifying castor oil. No. 2,292,902. Alexander Schwarcman to Spencer Kellogg and Sons, Inc.
Insolubilizing polyhydroxy sizes with aldehydo quaternary ammonium compounds. No. 2,292,921. Louis Bock and Alva Houk to Rohm & Haas Co.
Preparation of a saturated polycarboxylic acid by oxidation from non-drying and semi-drying hydroxylated fatty acids and unsaturated fatty acids of more than 8 carbon atoms and their esters. No. 2,292,950. Donald Loder and Paul Salzbert to E. I. du Pont de Nemours & Co.
Nitrogen substituted sulfimides. No. 2,292,998. Winfred Hentrich and Erik Schirm to "Unichem" Chemikalien Handels A.G.
Guanidine ammonium ferricyanide. No. 2,293,025. Robert Barnes to American Cyanamid Co.
Aliphatic alcohol ester of organic sulfonic acid salt of an aliphatic aminocarboxylic acid. No. 2,293,026. Harold Day and David Jayne, Jr. to American Cyanamid Co.
Method of producing dipotassium monosodium ferricyanide. No. 2,293,030. George Foster and Louis Lento, Jr. to American Cyanamid Co.
Method of preparing ammonium thiocyanate. No. 2,293,031. George Foster and Charles Funk, Jr. to American Cyanamid Co.
Apparatus and process for desliming flotation feeds. No. 2,293,033. Harry Mead and Ernest Maust to American Cyanamid Co.
Dioctyl cyanamide. No. 2,293,035. Richard Roblin, Jr. to American Cyanamid Co.
Manufacture of an aliphatic anhydride by oxidation of the corresponding aldehyde in the liquid phase. No. 2,293,104. Joseph Bludworth to Celanese Corporation of America.
Process of treating salt compositions containing earthy constituents as impurities. No. 2,293,111. Thomas Campbell and William Jacobsen.
Separation of carbon black or fine powders from gases. No. 2,293,113. Samuel Carney to Phillips Petroleum Co.
Solvent for dewaxinz mineral oils. No. 2,293,162. James Montgomery, Luke Goodson, and Robert Henry to Phillips Petroleum Co.
Purifying tetraethyl lead. No. 2,293,214. Edward Peck to Standard Oil Development Co.
Surface active agent, sulfated, aliphatic, monomeric, dihydric alcohol mononaphthenate. No. 2,293,265. Louis Mikeska to Standard Oil Development Co.
Malonic esters as insecticides. No. 2,293,309. Richard Roblin, Jr. and Ingenuin Hechenbleikner to American Cyanamid Co.
Purification of vinylidene chloride. No. 2,293,317. Fred Taylor and Lee Horsley to The Dow Chemical Co.
Stabilization of fatty acid derivatives. No. 2,293,350. George Martin to Monsanto Chemical Co.
Casein product and process of making. No. 2,293,385. Henry Dunham to The Borden Co.
Aminoplast containing a halogenated amide. No. 2,293,454. Gaetano D'Alelio to General Electric Co.
Froth flotation of siliceous material. No. 2,293,470. Harry Mead and Ernest Maust to American Cyanamid Co.
Disubstituted cyanamide compound. No. 2,293,472. Richard Roblin, Jr. to American Cyanamid Co.
Process for making certain amino ethers and various acylated derivatives thereof. No. 2,293,494. Melvin de Groote and Bernhard Keiser to Petrolite Corp.
Producing high grade, pale rosin by treatmeent of oleoresin with oxalic acid. No. 2,293,514. Donald Lister to Hercules Powder Co.
Art of making hexamethylenetetramine. No. 2,293,619. Emil Novotny and George Vogelsang to Durite Plastics, Inc.
Method of concentrating phosphate minerals from their ores. No. 2,293,640. Arthur Crago to Phosphate Recovery Corp.
Preparation of high molecular weight branched chain acids. No. 2,293,649. Benjamin Howk to E. I. du Pont de Nemours & Co.
Method of separating mixed solid fatty acids from animal fat. No. 2,293,676. Latimer Myers and Victor Muckerheide to Emery Industries, Inc.
Manufacture of levulinic acid and its compounds. No. 2,293,724. Eduard Faerber.
Process for hydrogenating soybean oil. No. 2,293,729. Arne Gudheim to Lever Brothers Co.
Polyamide solution in a solvent mixture. No. 2,293,760. Franklin Traviss Peters to E. I. du Pont de Nemours & Co.
Production of coated materials. No. 2,293,855. George Schneider to Celanese Corporation of America.
Process for making colorless or light colored alkylene oxide addition products. No. 2,293,868. Walter Toussaint to Carbide and Carbon Chemicals Corp.
Recovering nicotine from impure aqueous solutions. No. 2,293,954. Howard Tiger and John Dean to The Permutit Co.
Production of benzyl sulfonyl chlorides. No. 2,293,971. Gregg Dougherty and Robert Bath to Heyden Chemical Corp.
Insulin and pectin solution for injection purposes. No. 2,294,016. Benno Brahn to Rudolph de Villiers.
Process for agglomerating pulverulent material. No. 2,294,022. Samuel Carney to Phillips Petroleum Co.
Method of shutting off water in porous water bearing formations. No. 2,294,078. Willard Dow and John Grebe to The Dow Chemical Co.
Method of treating citrus fruit to produce citrus oil. No. 2,294,128. William Platt to California Fruit Growers Exchange.
Capillary-active agent which is salt of an acid ester. No. 2,294,259. Adrianus van Peski and Willem Coltof to Shell Development Co.
Stabilization of unsaturated ketones. No. 2,294,286. Hans Dannenberg and David Berleley to Shell Development Co.
Cobalt resinate and method of producing. No. 2,294,287. Herschel Elliott to Hercules Powder Co.
Method of sealing a casing in a well. No. 2,294,294. John Grebe to The Dow Chemical Co.
Purification of fusel oil. No. 2,294,346. Lloyd Swallen and John Tindall to Commercial Solvents Corp.
Reissue. Process for producing powdered milk product which comprises preparing aqueous non-milky medium, suspending and propagating therein culture of lactic acid bacteria. No. 23,170. Ninni Maria Kronberg to Svenska Mjolkprodukter Aktiebolag.
Reduction of nitrates. No. 2,294,374. John R. Bates, to Houdry Process Corp.
Surface-active incrustation inhibitor. No. 2,294,378. Rudolph S. Bley to North American Rayon Corp.
Surface-active incrustation inhibitor. No. 2,294,379. Rudolph S. Bley to North American Rayon Corp.
Treatment of pigments with ammonium naphthenate. No. 2,294,381. Harold E. Burdick to E. I. du Pont de Nemours & Co.
Process for the preparation of ethylene oxide. No. 2,294,383. Ray M. Carter to U. S. Industrial Alcohol Co.
Pyrolysis of methyl vinyl ether to aldehyde. No. 2,294,402. Rudolph L. Hasche and Benjamin Thompson to Eastman Kodak Co.
Process of preparing unglowed metal chromate catalyst. No. 2,294,-414. Maryan P. Matuszak and Glen H. Morey to Phillips Petroleum Co.
Purification of zirconium compounds. No. 2,294,431. Eugene Wainer to The Titanium Alloy Mfg. Co.
Method of converting oleic acid into mixture of mononomylamine and omega octylamino acid amide. No. 2,294,442. Frederick C. Bersworth to The Martin Dennis Co.
Subjecting tall oil to selective esterfication with lower aliphatic alcohol to effect esterification of fatty acids to exclusion of fatty acids to exclusion of resin acids. No. 2,294,446. Charles R. Brown and Ashton T. Scott to The Sharples Corp. (Sharples Chemicals, Inc.)
Process of clarifying spent solvents. No. 2,294,461. Colin C. Jones to Chemical Reclaiming Sales Co., Inc.
Corrosion inhibitor for lubricant. No. 2,294,525. Stanley P. Waugh to Tide Water Associated Oil Co.
Method for extinguishing burning molten magnesium and the like. No. 2,294,532. Joseph J. Fahey, Michael Fleischer and William W. Rubey.
Method for production of surface-coated sheet material characterized by moisture-proofness, grease-proofness about 95 parts by weight of an ethylene glycol-terpene maleic anhydride resin and between about 5 to about 30 parts by weight of a compatible, relatively soft polyethylene glycol-terpene maleic anhydride resin, applying the molten resinous composition in a thin film to a surface of a sheet and allowing the film to cool. No. 2,294,651. Wyly M. Billing to Hercules Powder Co.
Process of clarifying liquors containing suspended solids. No. 2,294,-697. John J. Seip.
Stabilized dry size composition comprising saponified rosin and, as an anti-oxidant secondary diarylamine. No. 2,294,723. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and, phenylenediamine derivative. No. 2,294,724. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and secondary monoarylamine. No. 2,294,725. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and diphenyl-methane derivative. No. 2,294,726. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and aromatic azo compound. No. 2,294,727. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and beta-naphthylamine derivative. No. 2,294,728. Arthur C. Dreshfield to Hercules Powder Co.
Stabilized dry size composition comprising saponified rosin and natural product containing a substantial proportion of resinotannol compounds. No. 2,294,729. Arthur C. Dreshfield to Hercules Powder Co.
Method of manufacturing bodies substantially free from porosity and having negative temperature coefficient of resistance. No. 2,294,-756. Hideo Inutsuka and Shujiro Kawase to General Electric Co.
Process of base exchange comprising contacting hard water with carbonaceous alkali metal zeolite. No. 2,294,764. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.
Process of base-exchange comprising contacting hard water with a carbonaceous hydrogen zeolite. No. 2,294,765. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.
Process of recovering pure sodium carbonate monohydrate from brines. No. 2,294,778. Alexis C. Houghton to Frederic A. Dakin.
Contact decolorization. No. 2,294,779. Julius Human to Velsicol.

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Extreme pressure lubricant. No. 2,294,804. Vernon L. Ricketts to E. I. du Pont de Nemours & Co.
Crystallized glucoside from red squill. No. 2,294,811 Arthur Stoll and Jany Renz to Sandoz A. G. Basel.
Extreme pressure lubricant. No. 2,294,817. Willem Johannes Dominicus van Dijck to E. I. du Pont de Nemours & Co.
Process of preparing an alkyl nitrate. No. 2,294,849. John F. Olin and Frederick P. Fritsch and Joseph J. Schaefer to Sharples Chemicals, Inc.
Treatment of drilling fluids. No. 2,294,877. Truman B. Wayne.
Preparation of reactive carbohydrates by treating carbohydrates with aliphatic amine dissolved in liquid, anhydrous ammonia. No. 2,294,925. Clemmy O. Miller and Arthur E. Siehrs.
In process of producing unsaturated aliphatic aldehydes the step which comprises reacting materials containing formaldehyde with another aliphatic aldehyde, in the presence of a lead acetate catalyst maintained at a temperature greater than 200°C. and less than 400°C. No. 2,294,955. Joseph H. Brank to Eastman Kodak Co.
In manufacture of artificial gas by procedure wherein the gas is subjected to a scrubbing medium essentially comprised of straw oil, the step which comprises scrubbing said gas with a straw oil scrubbing medium containing a small amount of an alkyl aminophenol. No. 2,294,972. Louis J. Figg, Jr. and Edward E. Shaulis to Eastman Kodak Co.
Process for producing and distilling aliphatic acids. No. 2,294,984. Rudolph L. Hasche to Eastman Kodak Co.
Catalytic re-forming of hydrocarbons. No. 2,295,197. Wayne Benedict and William Mattox to Universal Oil Products Co.
Process of selectively recovering desirable constituents of natural gas. No. 2,295,211. John L. Hall to Danciger Oil and Refineries, Inc.
Method of making vinyl-aromatic compounds. No. 2,295,077. Robert R. Dreisbach and James Day to The Dow Chemi al Co.
Process for producing rosin. No. 2,295,235. Jesse Reed to Claude Wickard, Sec. of Agriculture of U. S.
Process of producing potassium sulfate. No. 2,295,257. Charles Butt and Jacob Frank to International Agricultural Corp.
Carbocyclic nitriles and methods for their production. No. 2,295,406. Samuel Jolly to Sun Oil Co.
Process of separating siliceous matter from non-metallic ores by froth flotation. No. 2,295,459. Stephen Erickson to American Cyanamid Co.
As a new compound, 2-(p-(N-sodium methylene-sulfinate) aminobenzenesulfonamido)-pyridine. No. 2,295,481. Jonas Kamlet to Merck & Co., Inc.
Cetyl quaternary ammonium compound. No. 2,295,504. Robert Shelton to Wm. S. Merrell Co.
Diallyl fumarate, a colorless, mobile liquid having a boiling point approximately 114-115°C. at 7 mm. of pressure. No. 2,295,513. Theodore Bradley to American Cyanamid Co.
Method of producing steel. No. 2,295,334. Frances Clark and Robert Dirkes.
Method of increasing density of a mass of granular material. No. 2,295,294. Donald Ross.

Metals, Alloys

Method of heat treating oil well casings. No. 2,292,363. Thomas Crawford to Republic Steel Corp.
Chromium recovery method of producing a reaction mixture suitable for use in the production of chromium-bearing alloys. No. 2,292,495. Marvin Udy.
Continuous process of converting iron ore to metallic iron. No. 2,292,579. Thomas Moore to Standard Oil Development Co.
Material for hard facing metallic articles by melting the same onto the surface to be faced by means of an electric arc. No. 2,292,694. Paul Jerabek to The Lincoln Electric Co.
Recovering precious metals from ores which comprises subjecting such ore to solvent action of cyanide solution containing an alkali metal hydroxide. No. 2,293,066. Robert Lord to Southwesters Engineering Co.
Process for the treatment of iron-containing surfaces and product. No. 2,293,580. Isaac Walker to E. I. du Pont de Nemours & Co.
Lead base solder. No. 2,293,602. Edward Ferguson to North American Smelting Co.
Hard metal alloy, especially for tools. No. 22,166. Paul Schwarzkopf to The American Cutting Alloys, Inc.
Metal treating solution. No. 2,293,716. Van Darsey to Parker Rust Proof Co.
Electrical resistance alloy. No. 2,293,878. Victor Allen and Joseph Polak to Wilbur B. Driver Co.
Amelioration of iron ore contaminated with silica. No. 2,293,939. Frank Fahrenwald.
Fuse alloy. No. 2,293,762. Howard Reeve to Bell Telephone Laboratories, Inc.
Metal coating method and article produced thereby. No. 2,293,779. Robert Tanner to Parker Rust Proof Co.
Aluminum base alloy. No. 2,293,864. Philip Stroup to Aluminum Company of America.
Manufacture of steel casting. No. 2,293,972. Edward Dunn.
Method of separating metals from tin-containing metallic materials consisting principally of copper. No. 2,294,053. James Stack to Nassau Smelting & Refining Co., Inc.
Nickel Plating. No. 2,294,311. Rudolf Lind, William Harshaw, and Kenneth Long to The Harshaw Chemical Co.
Marking stick for marking hot metal surfaces. No. 2,294,403. Harry W. Heimer and Vintol L. Staley to Helmer-Staley, Inc.
Aluminum base metal composition. No. 2,294,405. Franz R. Hensel and Earl I. Larsen to P. R. Mallory & Co., Inc.
Austenitic stainless steel alloy of iron, chromium and manganese. No. 2,294,412. James R. Long.
Process for the reduction of aluminum. No. 2,294,546. Henri L. Gentil, to Alloy Processes Ltd.
Process of producing iron-alloy matrix with carbonized surface. No. 2,294,562. Walter E. Kingston to Hygrade Sylvania Corp.
Method of rolling magnesium-base alloys. No. 2,294,648. Gerhard Ansel and John C. McDonald to The Dow Chemical Co.
Sintered metallic composition having negative temperature coefficient of resistance. No. 2,294,755. Hideo Inutsuka and Shujiro Kawase to General Electric Co.
Hard surfacing welding alloy for iron and steel foundation metal. No. 2,294,834. Hugh S. Cooper, ½ to Frank H. Wilson.
Copper powder for use in manufacture of pressed shapes containing between 0.05% and 0.3% of tin in form of thin films alloyed on surface of particles of copper powder. No. 2,294,895. Joseph E. Drapequ, Jr. and Charles R. Rogers to The Glidden Co.
Alloy composed of 80% to 95% copper, a proportion of iron not less than a minimum increasing linerly with copper content from 1.25% iron at 80% copper to 2% iron at 95% copper, and the balance 1% to 18.75% zinc. No. 2,295,180. Edmund Mitchell to Western Cartridge Co.
Process for the recovery of metals belonging to the group consisting of gold, silver, copper, nickel and cobalt. No. 2,295,219. Bo Michael Kalling and Per Gustaf Brannstrom.
Condensation of metallic vapors. No. 2,295,226. Carleton Long to St. Joseph Lead Co.
Manufacture of Magnesium Metal. No. 2,295,105. Gunter H. Gloss and Robert E. Clarke to Marine Magnesium Products Co.

Paint, Pigments

Production of composite titanium pigments which comprises incorporating in a titanium dioxide pigment precipitated barium carbonate. No. 2 292 913. Isaac Weber and Arthur Neville Bennett.
Process for finishing paper and product. No. 2,293,278. Leroy Cates to S. D. Warren Co.
Production of composite titanium oxide pigments. No. 2,293,861. Henry Stark to E. I. du Pont de Nemours & Co.
Process for producing yellow pigmentizing composition. No. 2,294,306. Joseph Lang to E. I. du Pont de Nemours & Co.
Pigment of improved texture. No. 2,294,394. Archibald M. Erskine and Ben H. Perkins to E. I. du Pont de Nemours & Co.
Pigment manufacture. No. 2,294,426. Sylvester A. Scully to Interchemical Corp.
Method of controlling particle size in manufacture of calcium carbonate pigment. No. 2,295,291. Howard Roderick to Michigan Alkali Co.

Paper, Pulp

Coated Paper. Paper having a fusible, flexible, impermeable, and water-free coating. No. 2,292,518. John Helfrich.

Petroleum

A lubricant comprising in combination a hydrocarbon oil and a small quantity of trimethylene-1,2-disulfide. No. 2,292,456. Bert Lincoln and Gordon Byrkit to Continental Oil Co.
Method of removing weakly acidic organic compounds from petroleum oils. No. 2,292,636. Lawrence Henderson and George Ayers to The Pure Oil Co.
Lubricant semi-fluid neck grease comprising petroleum oil, blown asphalt, and comprising the reaction product of litharge and a fatty oil of fish origin. No. 2,292,672. Reuben Swenson to Standard Oil Co.
Catalytic conversion of hydrocarbons. No. 2,292,677. Charles Thomas to Universal Oil Products Co.
Process for catalytically converting hydrocarbon oil into high antiknock gasoline. No. 2,292,708. Julian Mavity to Universal Oil Products Co.
Process for production of motor fuel from petroleum oil boiling in the range below about 420° F., having high octane number and high susceptibility for knock suppressing agents. No. 2,293,205. Paul Harrington to Standard Oil Development Co.
Process of making varnish oil. No. 2,293,208. Arthur Lazar and William Klaus to Tide Water Associated Oil Co.
Hydrocarbon lubricant. No. 2,293,237. Jeffrey Bartlett to Standard Oil Development Co.
Refining petroleum oils. No. 2,293,241. Donald Campbell to Standard Catalytic Co.
Process of decomposing acid sludges to recover therefrom organic constituents capable of use as liquid fuel. No. 2,293,253. Harold Galindo and Benjamin Jones to Tide Water Associated Oil Co.
Process of producing octenes from butylenes. No. 2,293,353. Richard Moravec, William Schelling, and Charles Oldershaw to Shell Development Co.
Process of sweetening sour hydrocarbon oil containing mercaptans by treatment with a copper catalyst whereby mercaptans are converted to disulfides. No. 2,293,395. Lawrence Lovell and Louis Boullion to Shell Development Co.
Process for solubilizing lubricating oil additives. No. 2,293,419. Paul Van Ess to Shell Development Co.
Lubricant with high temperature stability. No. 2,293,445. Joseph Nelson to Standard Oil Development Co.
Method of treating acid raffinates from solvent extraction processes. No. 2,293,591. William Chenault to Sinclair Refining Co.
Treatment of paraffin hydrocarbons. No. 2,293,705 Herman Bloch to Universal Oil Products Co.
Process for catalytically reforming and desulfurizing hydrocarbon oil. No. 2,293,759. J. Robert Penisten to Universal Oil Products Co.
Process for conversion of hydrocarbons employing aluminum halide catalyst in absence of added hydrogen. No. 2,293,891. Bernard Evering and Edmond d'Cuville to Standard Oil Co.
Process of removing hydrogen sulfide from petroleum hydrocarbons. No. 2,293,898. William Hancock.
Process of dehydrating hydrocarbon gases. No. 2,293,901. Arthur Hutchinson to The Fluor Corporation, Ltd.
Catalytically converting hydrocarbons in processes where carbon is deposited on the catalyst. No. 2,293,946. Donald Payne to Standard Oil Co.
Method of treating hydrocarbon oils for subsequent cracking. No. 2,294,126. Ernest Ocon.
Process for preparing mineral oil solution of a metal derivative of an alkyl hydroxy aryl sulfide. No. 2,294,145. Carl Winning, Robert Van Voorhies, and John McNab to Standard Oil Development Co.
Stabilized mineral oil composition. No. 2,294,526. Stanley P. Waugh to Tide Water Associated Oil Co.

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Process for recovering gaseous fraction rich in polymerizable olefins from the mixture of vapors and gases produced in the conversion of hydrocarbons. No. 2,294,547. Clarence G. Gerhold and Bernard J. Flock to Universal Oil Products Co.
Cracking hydrocarbon oil. No. 2,294,565. William E. Lemen to Universal Oil Products Company.
Catalytic cracking of hydrocarbon oil. No. 2,294,584. Charles L. Thomas to Universal Oil Products Co.
Olefin Production. No. 2,294,696. George E. Schmitkons to Standard Oil Co., a corporation of Indiana.
Process for finishing mineral white oils. No. 2,294,884. Francis M. Archibald to Standard Oil Development Co.
Refining of mineral oils. No. 2,295,048. Reuben F. Pfennig to Standard Oil Development Co.
Hydrocarbon oils containing organic trisulfides as oxidation inhibitors. No. 2,295,053. Raphael Rosen and Robert M. Thomas to Standard Oil Development Co.
Separation of soaps from oils. No. 2,295,065. Hans G. Vesterdal to Standard Oil Development Co.
Drilling fluid comprising an aqueous slurry of clay containing saccharic acid. No. 2,295,067. Milton Williams to Standard Oil Development Company.
Process of catalytically polymerizing normally gaseous olefins. No. 2,295,125. Edwin F. Nelson to Universal Oil Products.
Process for breaking petroleum emulsions. No. 2,295,163 through No. 2,295,170. Melvin De Groote and Bernhard Keiser to Petrolite Corp., Ltd.
Lubricant comprising a lubricating oil and the reaction product of a phosphatidic material and an aromatic amine at temperatures below about 300°F. No. 2,295,179. Clarence M. Loane to Standard Oil Co.
Soap and lubricant containing the same. No. 2,295,189. Reuben A. Swenson to Standard Oil Co.
Lubricant comprising a lubricating oil and from about 0.01% to about 5% of the reaction product of a hydrogenated phosphatidic material and an organic amine at temperatures below about 300°F. No. 2,295,192. Maurice H. Arveson to Standard Oil Co.
Process and device for fractional distillation of liquid mixtures, more particularly petroleum. No. 2,295,256. Antoine Brugma.

Resins, Plastics

Ether resin. No. 2,292,406. Henry Rothrock to E. I. du Pont de Nemours & Co.
Polymeric composition by process which comprises intimately mixing non-fiber-forming synthetic polyamide with phenol free from amide-forming groups and then heating mixture with formaldehyde. No. 2,292,442. William Hanford to E. I. du Pont de Nemours & Co.
Method of molding plastic. No. 2,292,516. Walter Gloor to Hercules Powder Co.
Chlorine containing synthetic resins. No. 2,292,737. Alfred Blomer and Wilhelm Becker.
Resins of the sulfur dioxide-olefin type. No. 2,293,023. Robert Hills and Maxwell Barnett.
Plastic resin composition. No. 2,293,164. Frederick Myers to The Resinous Products & Chemical Co.
Method of controlling after-discoloration in a solid polycyclopentadiene resin polymer. No. 2,293,277. William Carmody to The Neville Co.
Polyamides and their preparation. No. 2,293,388. William Hanford to E. I. du Pont de Nemours & Co.
Film of polyvinyl acetal containing 0.5% to 5% of diester of phosphoric acid. No. 2,293,673. Albert Hershberger to E. I. du Pont de Nemours & Co.
Phenolic resin composition. No. 2,293,685. Viola Makeever to Makalot Corporation.
Solution of synthetic linear polyamide in an unsaturated alcohol. No. 2,293,761. Franklin Peters to E. I. du Pont de Nemours & Co.
Manufacture of cyanoacrylic acid esters. No. 2,293,969. John Crawford and Nancy McLeish and Thomas Wood to Imperial Chemical Industries, Ltd.
Method of producing olefin sulfur dioxide resins. No. 2,294,027. Frederick Frey and Robert Snow to Phillips Petroleum Co.
Solution of plastic olefin-polysulfide condensation product in volatile, organic, cyclid hydrocarbon solvent. No. 2,294,217. Emanuel Tengier to Ruetgerswerke-Aktiengesellschaft.
Method of converting polymerizable hardenable aliphatic ester into granular polymeric modification. No. 2,294,226. Gaetano D'Alelio to General Electric Co.
Plasticized polyvinyl acetal resin for safety glass. No. 2,294,228. Elmer Derby to Monsanto Chemical Co.
Polyvinyl acetal resin plasticized with diglycol propionate phthalate. No. 2,294,353. John De Bell and Elmer Derby to Monsanto Chemical Co.
Alkyd resins combined with amino triazine-aldehyde resins. No. 2,294,590. Herbert J. West to American Cyanamid Co.
Production of polymerization and condensation products from chlorinated hydrocarbons. No. 2,294,699. Erich Steffen, vested in the Alien Property Custodian.
Aminotriazine-aldehyde condensation products. No. 2,294,873. Gaetano F. K'Alelio to General Electric Co.
Process of producing waxy to resinous nitrogenous condensation products. No. 2,294,878. Hans G. Hummel and Michael Jahrstorfer to General Aniline & Film Corp.
Method of preventing abrasion of plastic sheeting. No. 2,294,985. Edwin H. Hilborn to Eastman Kodak Co.

Rubber

Process for curing golf ball covers and other materials by infusing solution into molded stock which is capable of penetrating stock without softening or causing deformation. No. 2,292,396. Robert Olin, Howard Cramer and Willis Reichard to The Worthington Ball Co.
Treatment of surface halogenated rubber. No. 2,292,454. Carl M. Langkammerer to E. I. du Pont de Nemours & Co.
Method of commingling rubber and unbeaten unbleached fiber. No. 2,292,492. Alfred Thomsen.
Process for laminating rubber hydrochloride to paper. No. 2,293,568. James Snyder to Wingfoot Corporation.
Method of making articles comprising porous rubber. No. 2,293,927. Carl Beal to American Anode, Inc.
Article comprising imperforate rubber having integrally attached to surface thereof coating layer of latex rubber pervaded by pores. No. 2,293,928. Carl Beal to American Anode, Inc.
Process for producing molded rubber articles. No. 2,294,071. Mitchell Carter to Rubber Products, Inc.
Method of embedding artificial cellulosic textile materials in a caoutchouc mass. No. 2,294,826. Wilhelm Bergenthun and Ernst Pieper.
Neoprene composition. No. 2,294,845. George M. Hamilton to Callender's Cable & Construction Co., Ltd.
Process for gelling an aqueous dispersion of neoprene. No. 2,295,030. Benton Dales to E. I. du Pont de Nemours & Co.
Process of shaping rubber hydrochloride material to form a protective covering for hats. No. 2,295,066. Roy J. Weikert.
Ethanol fermentation of blackstrap molasses. No. 2,295,150. Rafael Arroyo.

Textiles

Method of making mildew resistant fabricated fibrous products by applying to fibres while in loose unfabricated condition a mildew inhibitor. No. 2,292,423. Robert Yohe to The B. F. Goodrich Co.
Method for coloration of mixed material containing fibers of organic derivative of cellulose and animal fibers. No. 2,292,433. Cyril Croft to Celanese Corp. of America.
Process for coloration of surface-saponified cellulose ester textile materials in dark shades. No. 2,292,436. George Ellis and Alexander Wesson to Celanese Corp. of America.
Method for imparting finish to cotton yarn. No. 2,292,629. William Furness to American Rayon Co., Inc.
Process of treating textile material for purpose of modifying its surface characteristics. No. 2,293,844. Robert Maxwell to E. I. du Pont de Nemours & Co.
Process for increasing the water resistance of protein fibers and the like. No. 2,293,986. Theodoor Koch to American Enka Corp.
Process of curling casein fibers. No. 2,293,989. Anton Lely to American Enka Corp.
Process for rendering textiles water-repellent. No. 2,294,435. Edgar Wolf to Heberlein Patent Corp.
Manufacture of artificial filaments, foils and other materials, containing organic derivative of cellulose containing free hydroxy groups. No. 2,294,450. Henry Dreyfus to Celanese Corp. of America.
Process of conditioning textile yarns to render them amenable to textile operations such as knitting, weaving, spinning and the like which comprise applying thereto a yarn treating composition containing a terpene ether derived from a polyhydric alcohol and diolefinic terpene. No. 2,294,958. John R. Caldwell to Eastman Kodak Co.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published Sept. 30, 1941 (Cont'd)

Animal carcass treating method comprising covering the skinned meat surface with a cloth, applying a second cloth, enclosing the double clothed meat in a paper bag, freezing the meat, holding the meat in freezer storage and defrosting the meat. No. 399,667. Industrial Patents Corporation. (Beverly E. Williams and Leon L. Cadwell).

Preparing gelatinous material from gelatinous stock comprising treating the stock with a solution of water soluble salt of an alkaline earth metal, separating the salt solution from the stock, treating the stock with a water soluble alkali, and thereafter extracting the gelatinous material from the treated stock. No. 399,668. Industrial Patent Corporation. (Edward F. Christopher).

Porous material gluing process for laminating cellulosic sheets. No. 399,674. I. F. Laucks Ltd. (Theodore W. Dike and Harry Galber).

Calcium hypochlorite composition comprising a dry mixture of calcium hypochlorite, an alkali metal metaphosphate in an amount sufficient to render the mixture soluble in an aqueous solution of the class consisting of soap solutions, solutions of alkali detergents and hard waters, and sodium chloride in a proportion approximately 15-35% by weight of the mixture. No. 399,678. The Mathieson Alkali Works. (James D. MacMahon).

Dustless calcium hypochlorite produced by the improved method comprising adjusting the water content of an aqueous slurry of calcium hypochlorite to render the slurry plastic, preforming the plastic material under pressure into particles substantially free from fines and drying the preformed particles without substantial crushing. No. 399,679. The Mathieson Alkali Works. (Homer L. Robson and Gregory A. Petroe).

Production of dustless granular calcium hypochlorite by bringing an aqueous slurry of calcium hypochlorite to a plastic state, passing the resulting plastic material between closely spaced smooth hard rolls turning together with different peripheral speeds, removing the compressed plastic material from the faster moving roll, and drying the resulting chips without substantial crushing. No. 399,680. The Mathieson Alkali Works. (Homer L. Robson and Gregory A. Petroe).

Dry separation of particles such as seeds having different characteristics. No. 399,686. National Seed Cleaners Limited. (Frederick C. Dyer and Harold L. McClelland).

Vacuum crystallizer comprising a crystallizing chamber, a surmounting suction head, a relatively short diffuser venturi tube communicating therewith, and a thermo-compressor nozzle within said suction head directed towards said venturi tube but without the entrainment zone of said suction head. No. 399,710. Swenson Evaporator Co. (Gordon E. Seavoy and Harold B. Caldwell).

Incinerator comprising a multiple-hearth furnace. No. 399,714. Underpinning & Foundation Co., Inc. (George B. Lewers).

Manufacture of ferro-titanium alloys. No. 399,717. Vanadium Corporation of America. (John R. Davis, Jerome Strauss and Holbert E. Dunn).

Manufacture of ferro-titanium alloys. No. 399,718. Vanadium Corporation of America. (Jerome Strauss, Holbert E. Dunn).

Process for the preparation of compounds having the character of male sexual hormones. No. 399,723. Winthrop Chemical Company, Inc. (Max Bockmühl, Gustav Ehrhart, Heinrich Ruschig and Walter Aumuller).

Process for the production of oxo-compounds. No. 399,724. Winthrop Chemical Company, Inc. (Max Bockmühl, Gustav Ehrhart, Heinrich Ruschig and Walter Aumuller).

Process for the conversion into oxidized form of leuco derivatives of anthraquinone compounds which contain an amino group in one of the 1- and 4-positions and an amino group or a hydroxy group in the other of such positions, which comprises treating such leuco derivatives with substantially anhydrous sulfuric acid. No. 399,732. Henry Dreyfus. (Geoffrey Lord and George Reeves).

Process for the production of mother-of-pearl effects on transparent artificial films. No. 399,733. Henry Dreyfus. (Brian E. M. Miller).

Process for the manufacture of a lower alkylamine which comprises heating together to a temperature above 250°C. a substance selected from the group consisting of lower olefines and lower alkyl ethers, and an ammonium salt in aqueous solution. Henry Dreyfus. (Horace F. Oxley and Edward B. Thomas).

Process for the manufacture of a lower alkyl mono-amine substantially free from the corresponding di- and tri-amines, which comprises heating together to a temperature above 250°C. one molecular proportion of a lower alkyl alcohol and at least eight molecular proportions of an ammonium salt in aqueous solution. No. 399,735. Henry Dreyfus. (Horace F. Oxley and Edward B. Thomas)

Method of conditioning textile materials containing organic derivatives of cellulose which comprises applying thereto a conditioning fluid comprising a mineral oil, a softener for the organic derivative of cellulose, an aryl phosphate, a higher fatty acid and an alkylolamine. No. 399,741. Camille Dreyfus. (George W. Seymour).

Vat dyestuffs of the anthraquinone acridone series. No. 399,750. Fritz Baumann and Heinz W. Schwechten.

Phtographic bath useful for the production of colored photographic pictures by means of local destruction of dye at areas where metallic silver is present in a layer uniformly dyed with a reducible dye. No. 399,753. Bela Gaspar.

Granted and Published October 7, 1941.

Improvements in paper machines having a traveling web No. 399,764. Elzy E. Covey.

Apparatus for drafting textile fibers. No. 399,786. Charles Morton

Improvements in method of making plywood. No. 399,787. James V. Nevin.

Mannitol-free and alkali sulfate-free water soluble conditioning and humectant composition. No. 399,806. Atlas Powder Company. (Kenneth R. Brown).

Alloy containing chromium, columbium-tantalum group metal, iron, carbon and silicon, the combined percentages of chromium and columbium being at least 50%, the silicon being less than 20%, the carbon being less than 1%, and the remainder being iron and incidental impurities, the ratio of columbium to chromium being between 1:20 and 20:1. No. 399,825. Electro Metallurgical Company of Canada, Ltd. (Ernest F. Doom and William J. Priestley).

Process of producing opaque enamel-like, hard and protective coatings containing an oxide of a metal of the group titanium, zirconium, and thorium on articles of aluminum or its alloys. No. 399,826. Ematal Electrochemical Corporation. (Max Schenk).

Process for the manufacture of anhydrous sodium bisulfite. No. 399,829. General Chemical Company. (Jesse G. Melendy).

Process for the manufacture of sulfanilamide phosphoric acid derivatives. No. 399,830. Hoffmann-LaRoche Limited. (Kurt Warnat).

Method for consistently producing cast steels possessing freedom from porosity. No. 399,836. The International Nickel Company, Inc. (Albert P. Gagnebin).

Method of welding a hard overlay on a ferrous metal. No. 399,837. The International Nickel Company, Inc. (John T. Eash and Thomas J. Wood).

Method of controlling the pH of a set at specified temperature of a pectin within the range characterized by a temperature of set of 218°F. at a pH of 2.30. No. 399,845. Mutual Citrus Products Co., Inc. (Herbert T. Leo, Clarence C. Taylor and John W. Lindsey).

Processing fibrous material by applying thereto a composition comprising a sulfonated fatty material selected from the group consisting of animal, vegetable and marine oils, fats and their respective fatty acids and fatty esters, said sulfonated fatty material being characterized by being substantially free from moisture, inorganic salts and hydrolytic by-products. No. 399,847. National Oil Products Company. (Roland Kapp and Karl T. Steik).

Process of extracting oils from hardwood tar which comprises adding one to fifty part by weight of calcium oxide to one hundred parts by weight of hardwood settled tar, heating and distilling the mixture, and collecting the distillate. No. 399,854. Ministère de la Colonisation du Province de Québec. (Jean Levesque).

Fuel-containing vulcanizing platen comprising a fuel wafer disposed within a pan-shaped platen, and means securing the fuel wafer in spaced relationship with substantial portions of the side walls of said platen. No. 399,860. The Shaler Company. (Melvin L. Reibold).

Combustible fuel wafer for use in a vulcanizer pan wherein its lower surface will contact the pan and its upper surface will be exposed, said wafer having a flat body of highly ignitible moisture-proof fuse material bonded to and partially impregnating the exposed surface thereof over a substantial area in moisture protective relation thereto to assure ready ignition thereof. No. 399,861. The Shaler Company. (Harold H. Hanson).

Foreign Chemical Patents

Canadian Patents—p. 85

Process for the manufacture of partially reduced polycarbonyl compounds of the cyclopentanopolyhydrophenanthrene series, comprising causing polycarbonyl compounds of the said series to react with an alcohol capable of being oxidized to a carbonyl compound in the presence of a catalyst. No. 399,862. Society of Chemical Industry in Basle. (Karl Miescher and Werner Fischer).

Improved process for producing liner polymer of high molecular weight from olefins or mixtures rich in the same. No. 399,863. Standard Oil Development Company. (Robert R. Russell).

Improved process for the preparation of alkali metal salts of phenol sulfides comprising reacting a phenol in the absence of free water with sulfur and an alkali metal to form an alkali metal salt of the phenol sulfide. No. 399,864.

Detergent aid comprising tetra-isobutyl phenol sulfonic acid. No. 399,866. Standard Oil Development Company. (Louis A. Mikeska).

Detergent aid comprising sodium poly-alkyl phenol sulfonate in which the alkyl groups each contain more than 4 carbon atoms. No. 399,867. Standard Oil Development Company. (Louis S. Mikeska).

The method of treating feldspathic and similar rock material comprising treating the ground rock material with an organic fatty acid reagent to condition the material for separation of the magnetic and other impurities and thereafter subjecting the material to concentration to remove magnetic and other impurities conditioned by said reagent. No. 399,873. Ventures Limited. (William G. Hubler).

Process of preparing compounds of the cyclopentanoperhydrophenanthrene series including the step of causing an aluminum alcoholate in the presence of a ketone to act upon a compound of the cyclopentanopolyhydrophenanthrene series being substituted in 3-position by the hydroxyl group and in 17-position by a basic group. No. 399,882. Winthrop Chemical Company, Inc. (Max Bockmühl, Gustav Ehrhart, Heinrich Ruschig and Walter Aumüller).

Apparatus for recovering metal contents from ore pulp. No. 399,884. (John Hedley).

An ore mill comprising a chute, a mesh box, stamps operative in the mesh box, an anvil upon which the mesh box rests, and spring driving means for the stamps, said spring means comprising a plurality of spring arms carrying the said stamps at their free end portions. No. 399,885. William C. McKeirnan and Charles S. Davidson. (William C. McKeirnan).

Process for the manufacture of white stiffened fabrics and fabric articles. No. 399,887. Henry Dreyfus. (Donald Finlayson).

Method and apparatus for separating garlic or other impurities from cereal grains. No. 399,894. Charles Meneux, Louis Chausse and Sylvain G. Bourdin.

Process for making articles such as sheets, felts, mats and the like of glass wool, comprising preparing a suspension of glass fibers in water, filtering the suspension through a porous material which serves as a base for the finished article and finally drying the article. No. 399,896. Secondo Marocco.

Process for production of hydrogen peroxide which comprises subjecting a solution capable of yielding hydrogen peroxide on heating to the action of a high frequency electric field having a frequency of at least of the order of magnitude of one million cycles per second and arising from electrical conducting means out of direct contact with the solution being subjected to said field. No. 399,898. Johannes Antonius Lebuinus van de Lande.

Granted and Published October 14, 1941.

Manufacture of oxygen-containing compounds by reaction between an olefine and a substance selected from the group consisting of water and alcohols in presence of a compound of phosphorus dispersed in the gas phase. No. 399,908. Henry Dreyfus.

Mineral separator for the recovery or saving of gold. No. 399,910. George B. McKeever.

Method of producing sulfate of alumina containing over 60% $Al_2(SO_4)_3$ by mixing an aluminum containing substance with hot sulfuric acid and sufficient water, for a sufficient time to cause a reaction between the major portion of the acid and the aluminum constituent, discharging the product in the form of pebbles and then roasting the pebbles to complete the reaction and drive off volatile matter. No. 399,921. American Cyanamid & Chemical Corporation. (Richard A. Asbury and David Lurie.)

Method of producing a cyanamide which includes the step of reacting a compound chosen from the group consisting of yellow lead oxide, lead carbonate and basic lead carbonate with calcium cyanamide. No. 399,922. American Cyanamide Company. (Kenneth D. Ashley and Cyril B. Clark.)

Process for manufacturing dicyandiamide including mixing lime nitrogen with water, heating to about 180°F., agitating the heated mixture for about one hour, removing the calcium hydrate sludge, cooling the remaining solution to cause dicyandiamide to crystallize out, removing the dicyandiamide crystals, combining the resulting mother liquor with the calcium hydrate sludge and subjecting the mixture to autoclaving for the production of ammonia. No. 399,923. American Cyanamide Company. (George H. Foster and Rogers Gravell.)

A seed disinfectant comprising an inorganic cadmium compound and a mercury salt of a cyanamide or a substituted cyanamide. No. 399,924. American Cyanamid Company. (John L. Horsfall and David W. Jayne, Jr.)

Process of preparing aliphatic thiomides comprising reacting an unsubstituted alkyl nitrile having at least six carbon atoms in the alkyl radical with sulfur and an ammonium sulfide. No. 399,926. Armour and Company. (Anderson W. Ralston.)

Process for treatment of the leaf tissue of plants of the class of agave which comprises bringing trisodium phosphate into contact with the organic compounds of said leaf tissues in an amount just sufficient to render the mass alkaline and in the presence of no other reagent. No. 399,928. Avex Limited. (Jack May.)

Mixing method and apparatus therefor. No. 399,941. Crown Cork & Seal Company, Inc. (George W. Newton.)

Liquid-pressure-actuated motor for a filter. No. 399,942. The Cuno Engineering Corporation. (Philip E. Ashton and Sidney L. Wolfson.)

Method for the preparation of vinylidene chloride copolymers. No. 399,945. The Dow Chemical Company. (Edgar C. Britton, Clyde W. Davis and Fred L. Taylor.)

A copolymer of vinylidene chloride and an unsaturated aliphatic ether having the general formula R-O-R', wherein R represents an unsaturated aliphatic radical and R' represents an unsaturated aliphatic radical or a lower alkyl radical or substituted lower alkyl radical. No. 399,946. The Dow Chemical Company. (Edgar C. Britton and Clyde W. Davis.)

A copolymer of vinylidene chloride and at least one of the lower alkyl esters of at least one of the acids, acrylic acid and methacrylic acid. No. 399,947. The Dow Chemical Company. (Ralph M. Wiley.)

Manufacture of anhydrous sodium hyposulfite by preparing a sodium hyposulfite solution, evaporating it to an $Na_2S_2O_4$ content between 30 and 55% by weight, and salting out at a temperature between 55 and 65° the $Na_2S_2O_4$ in anhydrous form from the solution thus concentrated. No. 399,956. General Chemical Company. (Ralph S. Parks and George S. Simpson.)

Catalytic reaction apparatus and process. No. 399,961. Hercules Powder Company. (James H. Shapleigh.)

Preparation of a beef side for branding with an applied brand of sheet material. No. 399,962. Industrial Patents Corporation. (Andrew S. Hartanov.)

Method of treating paper stock for use in packaging products containing fats and oils which consists in incorporating phosphoric acid in the paper stock. No. 399,963. Industrial Patents Corporation. (Harold S. Mitchell.)

Production of a fine metal powder by coprecipitating a compound of a metal capable of being produced from the compound by a conversion operation at a temperature below its melting point with a distributing agent which prevents aggregating of the particles of metal and is capable of being removed without detriment to the metal, subjecting the coprecipitated mixture to the conversion operation and then removing the distributing agent. No. 399,964. Johnson, Matthey & Company Limited. (Alan R. Powell.)

A high vacuum pumping unit. No. 399,965. Kinney Manufacturing Company. (Harold I. Stoltz.)

Spacing member for interposition between contiguous refractory bodies in a furnace construction. No. 399,966. E. J. Lavino and Company. (Raymond E. Griffith.)

Process for making a skin-surfaced, porous fibre board. No. 399,974. Masonite Corporation. (William H. Mason.)

A woven pile floor covering having a base fabric and a pile, and edge binding for said floor covering comprising a rubber strip overlying and extending beyond the edge and holding down the pile and vulcanized through said pile to said base. No. 399,980. National Automotive Fibers, Inc. (George R. Cunnington.)

A feed consisting of approximately 1 ton of dry feed thoroughly mixed with from 0.5 to 20 ounces of a high vitamin concentrate to which an oil soluble and water insoluble dye has been added. No. 399,985. Pillsbury Flour Mills Company. (Chastian G. Harrel and Albert W. Lindert.)

Process for the production of an unsaturated aliphatic halide which contains more halogen atoms or more olefinic linkages than the unsaturated aliphatic halide undergoing treatment. No. 399,995. Shell Development Company. (William Engs, Alasdair W. Fairbairn and Herbert P. A. Groll.)

An emulsifiable spray oil composition comprising a mineral oil and a small quantity of an unsaponified fluid castor oil thermally treated under conditions to effect a change in its viscosity and molecular weight and to render it soluble in mineral oils. No. 399,996. Shell Development Company. (Wallace J. Yates.)

Process of improving flavor or odor of soya comprising treating soya with gas under conditions to promote absorption of gas, both soya and gas being at temperatures of about 40°C., and then expelling the gas to remove volatile flavoring or odoriferous substances. No. 399,998. Soya Corporation of America. (Artemy A. Horvath.)

Process for the manufacture of syrup from an aqueous starch suspension. No. 399,999. A. E. Staley Manufacturing Co. (Julian K. Dale and David P. Langlois.)

Apparatus for electrically treating a fluid comprising a discharge electrode, two non-discharge electrodes insulated from the discharge electrode and from each other and means for alternately establishing an electric field between the discharge electrode and each of said non-discharge electrodes. No. 400,017. Western Precipitation Corporation. (Henry A. Wintermute.)

Process for speeding development of plant life in sewage solids. No. 400,029. Clyde Potts. (Clyde Potts and Chester G. Wigley.)

Composite article comprising a sheet of glass coated with a layer of gelatine and a sheet of cellulose derivative plastic bonded to said gelatine by means of a water-soluble, film-forming, condensation product of a polyhydric alcohol with a compound selected from the group of hydroxy polycarboxylic acids and their acidyl derivatives. No. 400,030. Henry Dreyfus. (William H. Moss.)

Process for hydrating lime and product resulting therefrom. No. 400,031. Agostino Pozzi.

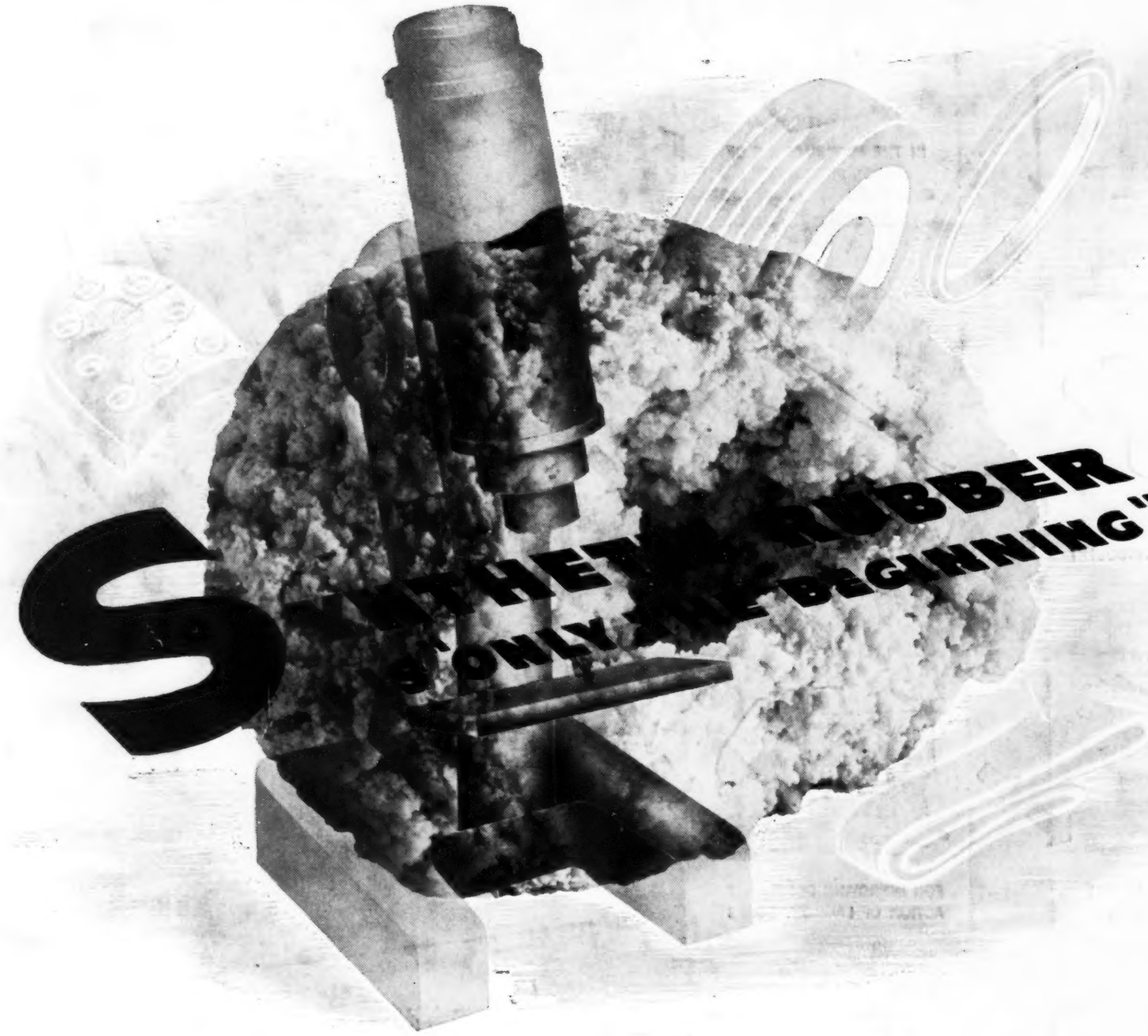
Process for the production of porous metal bodies which comprises forming a body of the finely divided metal, introducing a metal salt into the formed body in the form of a solution thereof and reducing the metal salt to metal **in situ**. No. 400,037. Hans Vogt. (Hans Vogt and Ernst Klotz.)

Process for the preparation of capillary active compounds. No. 400,038. Ludwig Orthner, Carl Platz, Hans Keller and Heinz Sönke.

Photographic material comprising a light-sensitive silver halide emulsion layer which contains color-forming development component capable of forming a dyestuff. No. 400,039. Gustav Wilmanns and Oskar Riester.

Process for the production of cycli amidines. No. 400,044. August Chwala.

Process for the continuous carbonization of cellulosic materials. No. 400,042. Auguste Lambiotte.



THE PUBLIC thinks of synthetic rubber in terms of tires, tubes, shower curtains and other finished products. But to the tire or rubber goods manufacturer it is simply a new *raw material* out of which he must fashion such products. And the basic differences between latex and the various chemical compounds we call synthetic rubber have given rise to many new and difficult problems of production. New compounding materials must be made available. New techniques for vulcanization, formulation and fabrication must be developed before large volume production of high quality synthetic rubber articles can be achieved. This is one of the biggest problems ever tackled by chemistry. And time is of the essence—for millions of tons of chemical rubber are needed to bring the war to a victorious conclusion.

Wishnick-Tumpeer, Inc. is in the thick of this great production battle that is now being won. Already from the Witco Research Laboratories have come new and remarkable materials that speed production and improve the quality of synthetic rubber products. Among these are Witco Carbon Black No. 12, which increases heat resistance in tire treads...Witcarb, a special filler that improves tensile and tear resistance...Witco Softener No. 20, which saves milling time...Stearite, a highly effective dispersing and vulcanizing aid. All of these developments were made possible by the company's special knowledge of rubber chemistry, and its long experience in helping the rubber industry solve compounding problems. This service is typical of the laboratory and technical cooperation Wishnick-Tumpeer, Inc. can give you if you use chemicals, oils, pigments, asphalts or allied products.

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